THE
# VETERINARY JOURNAL

**Editor:**
FREDERICK HOBDAY, C.M.G., F.R.C.V.S., F.R.S.E.,
HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING,
OFFICIER DU MÉRITE AGRICOLE (FRANCE),
CAVALIERE DEI SS. MAURIZIO E LAZZARO (ITALY),
HONORARY MEMBER OF THE AMERICAN VETERINARY ASSOCIATION,
PRINCIPAL OF THE ROYAL VETERINARY COLLEGE, LONDON.

**Sub-Editor:**
GLADSTONE MAYALL, M.R.C.V.S.

FEBRUARY, 1931.

## OUR "SPECIAL" SERIES OF ISSUES.

THE interest which has been taken by our readers in the recommencement of our series of "Special" numbers is very gratifying, and we are pleased to announce that the March issue will be devoted to the subject of Surgery and its allied adjuncts—Anæsthetics and Radiology.

The progress which has been made in all three of these subjects during recent years is as marked in Veterinary Science as in the practice of the Human branch, and the teaching of all three is carried out from a *practical* standpoint in each of our Colleges, where out-patients and in-patients clinics are encouraged.

The recent Special Poultry Number has a very interesting addendum on the poultry industry in this month's issue: an article from the pen of Mr. Norman Hole, of the Ministry's staff, which arrived too late for inclusion in the January list; and in it Mr. Hole emphasises the fact that a great deal of our loss of prestige in this branch of professional work is entirely due to our own apathy, and that, as a consequence, "we see unqualified and inexperienced persons doing work in the poultry industry on subjects to which the skill of our profession alone should be applied." This is for ourselves to remedy, and now that the subject is receiving much more attention in our teaching Colleges and research laboratories, steps must be taken to regain the confidence of the poultry owner and breeder; and when statistics show that there is more money invested in Great Britain in poultry than in wheat, it makes one realise that it is an industry which must be encouraged and supported.

XUM

## THE WORK OF THE LONDON QUARANTINE STATION.

THE constantly recurring outbreaks of Foot and Mouth Disease in Great Britain had at one time so affected the export trade of pedigree stock as to cause serious losses to the farmer and breeder, the animal markets of other countries being closed on this account. The remedial measures taken are an illustration of the value of co-operation, for the Veterinary Committee of the Royal Agricultural Society, with Sir Merrik Burrell, its Chairman, at the head, collaborated with the Empire Marketing Board, and in a few months the London Quarantine Station was the sequel. Here, in a carefully secluded part of Dockland, stables and pens for cattle, sheep and pigs were built in perfect isolation and security; and on these premises cattle and other farm animals destined for export abroad are now placed in quarantine for a sufficient length of time to ensure their absolute freedom from disease. Opened by Mr. Amery in 1928, and placed under the control of the Ministry of Agriculture and the Royal Agricultural Society, it has proved a veritable boon to pedigree stock-owners. Five hundred and forty-three animals passed through during its first 12 months, and 693 during its second year of existence. Australia alone took, between April and December 1929, no less than 215 cattle, 193 sheep, and 264 pigs; whilst large numbers of pedigree cattle, sheep and pigs have been sent abroad from here under the assisted passages scheme to British Columbia, Rhodesia and Kenya Colony.

In fact, the station is consistently full, and there is usually a considerable waiting list.

---

MAR 6 1931

# General Articles

## THE FREDERICK SMITH RELICS IN THE VETERINARY HISTORICAL MUSEUM.

By TOM HARE

" The proper piety is to preserve what our fathers thought good, either as a *précis* of the mind of the day, or, alternatively, for admiration and affection."—RICHARD SICKERT : *The Times*, March 15th, 1930.

THE formation of a veterinary historical museum, which one day might become a shrine of remembrance to the old and a source of inspiration to the young, had been my dream since graduation.

During the winter 1927–28 a number of relics from various parts of the Royal Veterinary College were gathered together as the nucleus of an historical collection. Permission to proceed with the work having been granted by the College authorities, I submitted an account of my scheme to Sir Frederick Smith for his criticism and advice. He replied (by letter, March 24th, 1928) : " I cannot tell you how much the proposal appeals to me. I greet it with hearty applause. It has long been wanted ; much useful and some valuable material has been lost to the profession by our utter indifference to the history of the past. If in odd moments you can salve from the wreck of time and indifference a few of our links with the past, you will have done yeoman service to the history of the profession. I hope to live long enough to see your dream materialise. I trust you will permit me to give it my very hearty blessing."

This blessing and encouragement were followed by a number of valuable gifts to the collection, and, before his death, he heard with manifest joy that the newly founded Historical Museum was receiving the support of a number of his professional brethren.

The recent announcement of the publication of the third volume of Sir Frederick Smith's " Early History of Veterinary Literature " suggests that some, who do not share the collector's enthusiasm, may be interested to learn what the museum can tell them of our great veterinary historian.

### Personal Relics.

His first gift is *the copper-plate engraving of the crest* (the caduceus, with motto " Primus in Indus ") *for the title page of the " Quarterly Journal of Veterinary Science in India and Army Animal Manage-*

XUM

*ment.*" Nominally, Charles Steel, F.R.C.V.S., I.V.S. (Bombay Army), Superintendent Army Veterinary School, Poona, was editor, assisted by Veterinary Surgeon Fred Smith (12th Royal Lancers, stationed at Bangalore), and Veterinary Surgeon John Henry Steel (Royal Artillery, H.S.F., stationed at Trimulgherry, Secunderabad). Actually the work was done by Smith, who undertook the financial responsibilities, and by his brother-in-law, J. H. Steel, who wrote the editorials. The first three numbers of the *Quarterly* were published (at 12 rupees per annum) under Smith's personal supervision by Stephenson, of Bangalore, on whose death the publication was transferred to the Lawrance Asylum Press, of Madras. On the completion of Volume III (1884–85), Charles Steel retired and, as the advertisement pages tell us, settled in private practice at 12, Lorne Terrace, Dublin, leaving his son and Smith as joint editors.

In addition to writing a record of veterinary progress each quarter, Smith contributed a number of original articles to the *Quarterly* (*vide* Appendix). His fertility of mind attracted the attention of Herr Moritzperles, of Vienna, who invited him to contribute articles on Indian subjects to the *Encyclopædia of Veterinary Surgery and Animal Management* (1883–84, ii, 420). On July 23rd, 1885, Smith was invalided for six months to England, but he did not return to India. From Netley Hospital he passed as assistant-professor of the Army Veterinary School, Aldershot, to an environment more sympathetic to his original and purposive mentality, whence the veterinary profession received such valuable additions to its knowledge and public reputation. His co-editor, Steel, who in 1886 was promoted Superintendent (later Professor) of the Bombay Veterinary College, recorded Smith's promotion to Veterinary Surgeon, 1st Class (October 9th, 1886), also the appreciation with which his lectures on military veterinary hygiene were received by those attending the Aldershot School (1886–87, v, 23). He reviewed the *Manual of Veterinary Hygiene*, 1887 (price 10*s.* 6*d.*), and offered his congratulations to its author (1886–87, v, 325). When on home-leave Steel visited the Aldershot School, and on his return to India paid high tribute (1887–88, vi, 447) to the zeal and energy with which Smith, now full professor, had re-created the school. He also recorded Smith's election to the Fellowship of the Institute of Chemistry (1889–90, vii, 121).

In spite of his absence, Smith continued, as joint editor, to share the financial burden of the *Quarterly* until 1890, but he only contributed two more articles (*vide* Appendix, Nos. 28 and 29). Then came Steel's announcement of the dissolution of the co-editorship. "He had based his withdrawal on the fact that he is unable

to agree fully with the tone and matter of some recent editorial articlse and paragraphs criticising Army affairs, and which, we regret to add, had been considered unsatisfactory by the War Office " (1889–90, viii, 336). Steel, the trenchant critic, impatient at the delay in reforming the Army Veterinary Services, was in India ; Smith, who knew not only the facts but the need for restraint, was in England. Steel fired off in Vol. VI, and Smith, too far removed to make his disagreement effective, was near enough to the War Office to receive all their retaliation. The dissolution, which left their friendship unimpaired, was the inevitable result of an honourable difference in principle between two strong, possibly inflexible, wills.

Steel was a very sick man. In his last editorial he had expressed his determination to keep the *Quarterly* alive, but his publisher was impelled to add a notice that " owing to the very severe illness of the editor compelling him to leave India, perhaps prematurely, this Journal can no longer be continued. It therefore expires on 31st December." But Steel never left India ; he died at Bombay, Thursday, January 8th, 1891.

On my visit to him (August 11th, 1928) the General expressed a deep affection for his brother-in-law when presenting *Steel's Microscope* to the Museum " as the relic of a great man and a good friend." This microscope was assembled by the late Sir George Brown for Steel, who took it for his investigation of Surra to India and thence to Burma, the climate of which destroyed the original wooden case. Steel's report " On the disease which prevailed among transport mules, etc., in British Burma during the years 1883–84 and 1884–85," was published at the Government Press, Madras.

The third personal relic is the *Galton Whistle*, given to Smith by Sir Francis Galton, who devised it for testing acuity of hearing. " It can be regulated by the screw, and a note inaudible to the human can be picked up by the cat."

## Relics of Research.

*No.* 4 is the *horse shoe* " containing at the toe and heel electric bell pushes for registering, by means of duplicate bells, which portion of the foot comes to the ground first." The apparatus (described and illustrated in *Vet. Record*, 1891–92, iv, 263) " was not a success." *No.* 5 is the *horse shoe* devised by Farrier-Major Miles to Smith's instructions for the mechanical treatment of contracted feet (*Jour. Comp. Path. and Ther.*, 1892, v, 97). *Nos.* 6 *and* 7 comprise a *large wooden model of a horse's foot*, and a series of *histological sections* with which Smith illustrated his lecture on " The structure and



XUM

function of the horse's foot" before the Royal Institution of Great Britain, May 3rd, 1895.

The *Quarterly* reveals Smith's great interest in the pioneer studies of eye diseases conducted in Germany. He devised in guttapercha an *artificial eye* for the horse (*No.* 8) and copies of this model, the first used in the horse, were subsequently made by Arnold & Sons. *No.* 9 includes three cases of *ophthalmoscopic instruments* employed in his investigations of the physiology and pathology of the horse's eye (*Jour. Comp. Path. and Ther.*, 1894, vii, 110, and 1896, ix, 138, also *Proc. Royal Society*, 1894, lv, 414). *Two boxes of sections* (*Nos.* 10 *and* 11) illustrate "a peculiar opaque band about the centre of the periorbita, in which I detected unstriped muscle," and "the eyeball and periorbita beginning at the equator and carried back in series to the optic chiasma" (*Jour. Anat.*, 1922, lvi, 366). *No.* 12 in a *mirror* for illuminating the nasal chamber of the horse.

There are *histological sections* of the vocal cord of the horse (*No.* 13) and of the tactile extremity of the elephant's trunk (*Jour. Anat. and Physiol.*, 1889–90, xxiv, 493). *No.* 14 is a *case of negatives* illustrating the mechanism of rope galls in camp (*Annual Rept. to W. O.*), and of ancient manuscripts ("*The Early History of Veterinary Literature*," Vol. I, London, 1919). *His dissecting instruments* (*No.* 15) and *box of metric weights* (*No.* 16) are included. Smith's study of the physiology of digestion is represented by *eleven woodcuts* (*No.* 17) which illustrated his "Veterinary Physiology."

Among the gifts I found a little box containing two dried preparations and a label, dated November 15th, 1879, which can speak for itself. "In November, 1879, I had an attack of Horse Pox to deal with. In those days the disease was called Stomatitis Pustulosa Contagiosa. I put some of the lymph aside to test its activity in future years. It is difficult to remember events of fifty years ago, but these slides are evidence of my early desire for experimental inquiry and exact knowledge." I thought the General's experiments should be completed, and fifty years and one month later Professor J. G. Ledingham and Dr. J. T. Edwards very kindly inoculated guinea-pigs with the dried material, but no evidence of the presence of living virus was obtained.

## Relics of War.

A few trifles in the museum show that Smith, like most of us, had a childlike acquisitiveness tempered with a sense of humour. He described a *piece of brass* (*No.* 18) as follows: "When the Dervish Army was destroyed in the Soudan of 1898, Lord Kitchener had the Mahdi's tomb blown up and the remains of the gentleman thrown

into the Nile. There was a railing around the tomb with brass ornamentation. This is a portion of it." *No.* 19 is an illustrated manual "*Die Uniformen der Deutschen Armee*, 1889," which belonged to Major Albrecht, Commandant of the Orange Free State Artillery. "It came into my possession at the capture of Bloemfontein in 1900." *No.* 20 is the "*Concept-Wetten*, 1898," of the South African Republic, which "I took from the desk of President Kruger in the Transvaal House of Parliament on the day we entered Pretoria, 6 June, 1900." The pencil sketches of Kruger on a number of its pages, probably drawn by some bored politician, add interest to the document. Smith devised an "*anti-stumbling shoe*" (*No.* 21) for his Arab pony, which "went through the whole of the South African War, 1899–1902, and wore shoes of this pattern for eighteen months."

## His Last Gift.

Unfortunately, limitation of space has necessitated the telling of our story in the form of a museum catalogue, though as far as possible Smith's own notes and comments have been preserved. His gifts reveal to us a little of his activities, but much of the intelligence, thoroughness and energy of the scientist, soldier and administrator.

On August 12th, 1928, he had written: "I hope some day to rest there myself amidst the work I have loved so well," and on July 31st, 1929, his ashes, within a marble casket, were placed amidst the relics of veterinary history. And we, looking upon the earthly remains of the greatest man our profession in England has produced, shall recall Smith as "a runner who hath run his round . . . and is glad of his rest,"* and as he "handeth his staff away" we shall take it up, giving our energies to maintain the lead he gave us.

## APPENDIX.

### Smith's Contributions to the "Quarterly Journal of Veterinary Science, India."

(1) "Veterinary Surgery," 1882–83, i, 16, 159, 353, 510 ("Anatomy and Method of Examining the Horse's Abdomen, Gastrorhexis Rupture and Dilatation of the Stomach"); (2) "Veterinary Military Hygiene," 1882–83, i, 111, 263, 445, 566; and 1883–84, ii, 241 ("Digestion of the Horse"); (3) "On the Excision of Nerves for the Relief of Certain Forms of Lameness," 1883–84, ii, 258; and 1884–85, iii, 79; short articles in Vol. II: (4) "Fracture within the Stifle Joint," p. 236; (5) "Dislocation of Hip-Joint," p. 237; (6) "Acute

* From "The Testament of Beauty." Robert Bridges, 1929.

Spinal Paralysis," p. 239; (7) "Fracture Compound Comminuted," p. 240; (8) "Pyometra," p. 413; (9) "Acute Spinal Meningitis," p. 516; (10) "Myelitis," p. 517; (11) "Bursattee," p. 524; (12) "Actions of Aconite on the Horse," p. 526. (13) "Report on Manœuvres," p. 389, under "Bangalore Camp of Exercise, 1884," 1883–84, ii, 386; (14) "Observations upon an Article on the Ophthalmoscopic Appearances of the Fundus of the Horse's Eye" (1883–84, ii, 401), written by Berlin in the *Zeitschr. f. vergleich. Augenheilkunde.* This journal of comparative ophthalmology was founded in 1882, and edited by Professors Berlin and Eversbusch, both human ophthalmologists, who at a later date obtained the collaboration of J. Bayer and other German veterinary surgeons. Publication ceased with the 7th volume (*vide* Nicholas E., "Veterinary and Comparative Ophthalmology," translated and edited by Henry Gray, London, 1914). (15) "Calcareous Degenerations in the Horse," 1884–85, iii, 121; (16) "Veterinary Hygiene," 1884–85, iii, 206, 336, 496 ("On Food of the Horse"); short articles in Vol. III; (17) "Anthrax," p. 240; (18) "Ruptured External Iliac Vein," p. 365; (19) "Strangulation of Rectum," p. 366; (20) "Sprain," p. 366; (21) "Anthrax," p. 367; (22) "Impaction of Œsophagus," p. 528; (23) "Aortic Aneurism," (?) p. 529; (24) "Rabies," p. 530; (25) "Epilepsy," p. 530; (26) "Paralysis," 5 cases, p. 533, republished as "Clinical Records," *Jour. Comp. Path. and Ther.*, 1893, vi, 366; (27) "Experimental Therapeutics," 1885–86, iv, 130; (28) "Life of Edward Coleman, F.R.S., M.R.C.S." (abstracted from "Life of Sir Astley Cooper," by Bransby Cooper), 1885–86, iv, 271; (29) "Equine Anthrax in India, its Clinical and Pathological Features," 1886–87, v, 23.

---

## "CIRCLING" DISEASE OF SHEEP IN NEW ZEALAND.

By DUDLEY A. GILL, M.R.C.V.S, D.V.S.M.
*Veterinary Laboratory, Wellington, New Zealand.*

*Symptoms and Occurrence.*—The disease occurs in the autumn from about February to June, and usually attacks hoggets, though sometimes older sheep are also affected. It is said to be more prevalent than usual towards the end of a spell of dry weather, and that soon after the weather breaks the losses decline and stop.

The symptoms are often of short duration, but may last several days. I have heard of no recoveries. There is dullness with a tendency for the affected sheep to keep by itself and to wander. Fre-

quently the head is held a little to one side, or may be retracted, or again in other cases, it is held low. In the majority of cases there is forced movement in the form of a circle to the left or to the right, though many affected sheep wander till eventually their heads come in contact with a fence or some other obstruction, when they stand pressing their foreheads against it. There is a marked tendency to somnolence.

Frequently there is considerable salivation, often some nasal catarrh, and very frequently œdema and suffusion of the conjunctiva of one or both eyes.

*Incidence.*—The disease, or a condition so like it that for the present it is assumed to be the same, occurs in the Wairarapa, in the King Country, and in Hawkes Bay. It most probably occurs elsewhere also. The heaviest loser so far met with is a farmer of the Longbush district, Masterton, Wairarapa. He has about 500 sheep on his farm, which is mostly rolling limestone country with a few acres that is lower lying and borders a stream. Last year about thirty head were lost from this cause, and this season about twenty. These losses recur annually, and the owner is under the impression that it may have been this which led his predecessor to sell the place. Some of his neighbours also have such losses, but not to the same extent.

*Theories as to the Cause.*—"Grub in the head" (œstrus larvæ), and "Cyst on the Brain" (*Cœnurus cerebralis*) have been the popular theories. Another type of fly than *Oestrus ovis* was blamed by a farmer in Hawkes Bay for his losses. This was identified as *Hystrichia pachyprocta*, whose larvæ parasitise many injurious caterpillars, and are presumably harmless for livestock. The Livestock Division has considered the dry feed and resulting digestive disturbances the most probable explanation. Prior to the present season the writer made post-mortem examinations of four such cases and could find no macroscopic explanation. Cœnurus cysts were not present, the middle ear was normal, less than one nasal bot per carcase was found. The brain appeared normal to the naked eye. The first three stomachs were slightly impacted and the abomasum and intestine showed varying degrees of helminthiasis, though not more than one might expect to find in any other young sheep in the flock.

## The Present Investigation.

*Case* 1.—On 14/4/30, losses having again been reported by the Longbush owner, his farm was visited in company with Mr. T. Hankin, Government Veterinarian, Masterton. One sheep had been found ill and "circling" on the previous day, and we were fortunate in arriving before it died. It was killed by bleeding, samples of blood

being taken for biochemical examination. Post-mortem examination showed the rumen to be filled with very coarse herbage, some trichostrongyles in the abomasum, and a somewhat heavy infestation of the small gut with the sheep hookworm (*Bunostomum trigonocephalium*—identification subsequently confirmed) with large numbers of the characteristic pin-head hæmorrhages which this worm causes. Portions of liver, spleen, kidney, and small gut, and the whole of the brain, were placed in 5% formalin, and taken back to the Wallaceville Laboratory for examination in section.

The blood analyses made upon the samples from this cases, and on others taken from three healthy sheep on the same farm, were as follows:

| | Calcium. | Phosphates. | Sugar. | T N P N. | Creatinine. | Chlorides. | Hæmoglobin. | Blood Counts. Polymorphs. | Lymphocytes. | Mononuclears. | Eosinophiles. | Basophiles. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "Circling" Sheep | 10.5 | 6.0 | .235% | 35 | 1.4 | 490 | 70% | 69 | 29 | 2 | — | — |
| Control 1 ... | 10.1 | 5.0 | .048% | 30 | 1.21 | 460 | 83 | 29 | 66 | 4 | 1 | — |
| Control 2 ... | 10.4 | 4.8 | .064% | 29.2 | 1.27 | 475 | 61 | 30 | 68 | — | 2 | — |
| Control 3 ... | 11.0 | 5.5 | .063% | 30.1 | 1.2 | 475 | 70 | 25 | 70 | 2 | 3 | — |

The significant differences are underlined and will be referred to again later.

Of the tissues brought back to the laboratory, the only one to show striking abnormality in sections was the brain. The cerebrum showed an œdematous condition of the piamater, considerable engorgement of the vessels in and under it, and some slight but definite round-cell infiltration of their walls. A section of the striated nucleus showed several marked aggregations of polymorphonuclear and mononuclear leucocytes, amongst which were to be seen numbers of organisms. These were gram positive, but in the sections it was impossible to say whether they were short rods or cocci in the process of dividing. In this section slight perivascular cuffing was also present (Photograph 1).

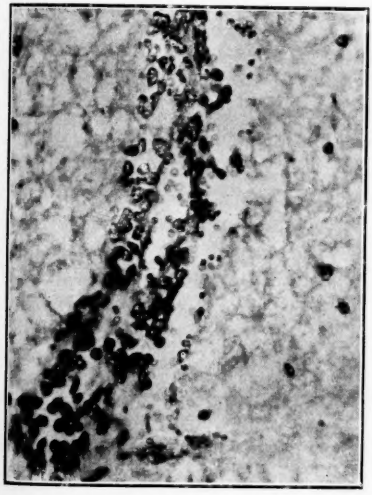
*Case* 2.—Shortly after this (7/5/30) a portion of brain substance comprising the medulla, pons, corpora quadrigemina and cerebellum was received from a lay Inspector of Stock at Te Kuiti in the King Country. The owner had lost three hoggets with "symptoms

No. 1

Small purulent focus in corpus striatum showing organisms. Staining gram-Jensen. Case 1.

No. 2.

Corpus quadrigeminus. Case 2 showing aggregation of polymorphs and round cells (below) and longitudinal section of perivascular cuff (above).



No. 3.

Perivascular cuff in corpus striatum. Case 3.

No. 4.

Round cell infiltration of cerebral meninges. Case. 4.

characteristic of *Cœnurus cerebralis.*" The specimen was obtained from a fourth similarly affected hogget which was killed for the purpose. Sections showed the following abnormalities : Corpora quadrigemina ; well-marked perivascular cuffing ; some small aggregations of round cells and polymorphonuclear leucocytes, but no organisms could be detected (Photograph 2).

Cerebellum : very slight lesions similar to those in the corpora quadrigemina.

*Case* 3.—On 14/5/30, the head of a sheep was received from the farmer in Hawkes Bay, who considered the condition was caused by the sheep being " struck in the nostrils " by the fly identified as *Hystricia pachyprocta.* Sections of the cerebrum and from the corpus striatum showed the following : Cerebrum—the pia mater is slightly œdematous and shows small areas of cellular infiltration.

Corpus striatum : well marked and extensive perivascular cuffing (Photograph 3).

*Case* 4.—On 21/5/30, an affected sheep was received, still living, from Te Kuiti, and the following information regarding the symptoms shown by affected sheep on this farm was included in a covering letter from the local Stock Inspector :—

" The first symptom is the drooping of one ear, then the head is turned in the opposite direction, and the eye always commences to water. That is, if the left ear droops the head is turned to the right, the right eye discharges, and the sheep will turn to the right in circles which get smaller till it turns in its own length and falls. My own observations in the field confirm these symptoms."

On arrival the animal (a cross-bred Romney ewe hogget) was very ill, but was not moribund. If propped up it could stand, and persistently turned on its own axis to the right. There was slight œdema of the conjunctiva and watering of the eyes, more noticeable on the right side than on the left. Its temperature was 107 degrees, but probably the long railway journey was responsible for this, in part at any rate. It was killed by bleeding. Post-mortem examination revealed no notable lesions in any organ except the central nervous system. Some cerebro-spinal fluid was collected from the lumbar region, with precautions as to sterility. It did not appear to be under any undue pressure, but was distinctly cloudy. The skull was then opened with due regard to asepsis and brain substance was collected for cultures and for sections. The results of various examinations made were as follows :—

*Blood.*—A slight increase in the sugar content (0.095%), and a differential leucocyte count showing 77% polymorphs, and 21%

No. 5.

Cellular infiltration surrounding small meningeal vessel in a sulcus. Cerebrum of Sheep 211.

No. 6.

Cellular infiltration of meninges in lumbar portion of cord. Sheep 211.

No. 7.

Cellular infiltration of cerebral meninges. Case 5.

No. 8.

Perivascular cuff cerebrum. Case 5.

XUM

lymphocytes. The other constituents of the blood were within the normal range.

*Cerebro-spinal fluid.*—Pandy's globulin test, positive; cells, 600 leucocytes per c.m.; sugar, 0.073%.

*Brain sections.*—There was slight thickening and round-cell infiltration of the cerebral pia, and some small areas of round-cell infiltration in the cerebellar stalk.

This part of the examination was not considered satisfactory, as in other similar cases definite lesions have been fairly well confined to the base of the brain, and this portion was utilised for cultural examination (Photograph 4).

*Cultural examination of brain substance and cerebro-spinal fluid.*—The cultures from the brain yielded a growth of short gram-positive rods, while those from the cerebro-spinal fluid yielded an oval diplococcus with a tendency in broth media, and more especially in the water of condensation of serum slopes, to form short chains of six to ten elements. The individual cocci tended to lie at a slight angle to each other, reminiscent of the appearance given by many strains of enterococci.

The pathogenicity of these two organisms for sheep and rabbits was then tested as follows (the inoculum in each case was a twenty-four hour beef broth culture) :—

*Gram positive rod from brain.*—Rabbit 1: 1 c.c. intravenously; result *nil.* Rabbit 2: 1 c.c. intraperitoneally; result *nil.* Sheep No. 210 (hogget): 1 c.c. intraspinally in lumbar region; result *nil.* Sheep No. 212 (hogget): 2 c.c. intravenously; result *nil.*

*Gram positive diplococcus from cerebro-spinal fluid :—*

28/5/30.—Sheep No. 209 (hogget): 2 c.c. intravenously.

30/5/30.—Slightly straddling and uncertain gait with the hind legs. This trouble gradually disappeared till by 10/6/30, the animal was normal Between these dates, however, it evinced two acute but very transient attacks of lameness affecting the left hind leg It has remained entirely normal to date (three months).

28/5/30 —Sheep No 211 (hogget): 1 c.c. intraspinally in the lumbar region. As this experiment appeared to give a positive result, notes which were made of its progress from day to day are given in full :—

28/5/30.—2.45 p.m. was the time and date when the experimental inoculation was made.

29 and 30/5/30.—Normal.

XUM

31/5/30.—Seemed a little dull when the sheep were brought into the yard to have their temperatures taken. While being taken back to the paddock—about thirty years of very rough going—it suddenly had a convulsive fit. This lasted about half a minute only. It was then carried on to the paddock, and by that time could stand and move, but was quite blind, swayed on its feet, and tended to move in a circle. Seen again three hours later, it could see quite well and was moving about feeding normally with its mates.

1/6/30.—Had another convulsive fit while being driven in for temperature taking. Went through the same procedure as yesterday, but this time recovery took longer and was not so apparently complete.

2/6/30.—Found down in the paddock. Was carried into the yard where it lay on its side giving an occasional convulsive struggle, and seemingly moribund for about two hours. It then struggled to its feet and stood dully, with its head nearly touching the ground and salivating copiously It was blind, and while the left eye remained open, the right was kept shut On examining the eyes, the left appeared normal, but the conjunctiva of the right was very œdematous. Placed it in small paddock in the afternoon It was still dull and stupid, quite blind, but ate grass greedily for about half an hour and then seemed to go to sleep on its feet and could not be roused.

3/6/30.—Was eating freely and seemed much brighter, though still blind and stupid. While I was watching it, it suddenly stopped feeding and set off walking in a circle to the left. It kept this up for six minutes, the circle being roughly ten feet across. It then started feeding again.

4/6/30.—Was found about a quarter mile away, where it had wandered during the night. Quite bright, but still blind and stupid. Showed no tendency to circle while being driven back.

5/6/30.—Much better; still silly and right eye still inflamed, cornea now slightly cloudy but can see enough to avoid running into obstacles. On dogging it about in the paddock with a quiet dog for a few minutes it became very excitable and silly, and started going in a large circle to the left.

6/6/30.—Casual observation showed nothing abnormal. The signs of impending recovery were so marked that I killed it lest the lesions underwent regeneration.

The inoculated organism was recovered in pure culture from the cerebro-spinal fluid. A careful examination of several sections of spinal cord, brain, and the optic nerves showed a well-marked

XUM

cellular infiltration of the meninges of the brain and the cord, but no other lesions were discovered (Photographs 5 and 6).

A differential blood count of this case on 5/6/30 gave :—Polymorphs, 34% ; lymphocytes, 62% ; eosinophyles, 4%.

Examination of the blood and cerebro-spinal fluid at the time of death gave the following :

*Blood.*—Sugar, 0.061% (normal) ; polymorphonuclears, 31% ; lymphocytes, 64%, which is not markedly abnormal. The other constituents were within normal range.

*Cerebro-spinal fluid.*—Pandy's globulin test strongly positive ; leucocytes, 6,000 per c.m. ; sugar, 0.04% ; T.N.P.N. 30.

5/6/30.—Adult white rabbit, inoculated intravenously with one c.c. twenty-four-hour broth culture of the organism in question : appeared to be entirely normal till 10/6/30, when it was obviously ill, and was almost completely blind, though both eyes appeared normal. It was killed, and the heart blood, cerebro-spinal fluid, and brain substance were cultured. The inoculated organism was recovered in pure culture from the heart blood, but the remaining cultures remained sterile.

Sections of brain showed intense engorgement of the vessels in the meninges and some aggregations of polynuclear leucocytes and round cells in connection with the chorioid plexus. Examination of this rabbit's blood and cerebro-spinal fluid gave the following results :—

*Blood.*—Sugar, 0.290% ; polymorphonuclears, 70% ; lymphocytes, 27%.

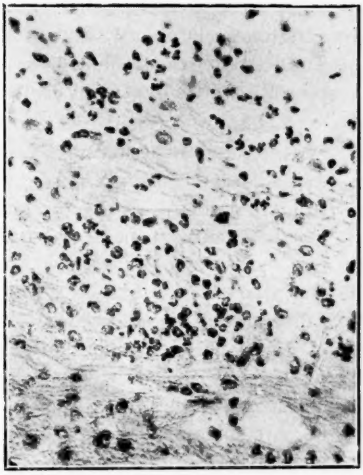
*Cerebro-spinal fluid.*—Pandy's globulin test, faint but definitely positive ; sugar, 0.200% ; leucocytes, 104 per c.m.

*Cases 5 and 6.*—On 5/7/30, the Longbush farmer brought two affected sheep to the laboratory by car. One was a two-tooth Romney ewe which had been bought in with others about four months previously. The other was a home-bred Southdown ram hogget. Neither was able to stand at that stage, but they lived overnight, nevertheless. The Southdown was the worse of the two. Temperatures were : Romney, 104 degrees ; and the Southdown, 104.2 degrees. Both were blind. They were killed by bleeding on 6/7/30, and a post-mortem examination revealed the following :

*Romney*—fairly numerous trichostrongyles in the abomasum, but no manifest inflammation. In the duodenum a small number of *Cooperia oncophora* were found, while towards the ileum there were a few œsophagostome nodules, and one area of about two feet in length

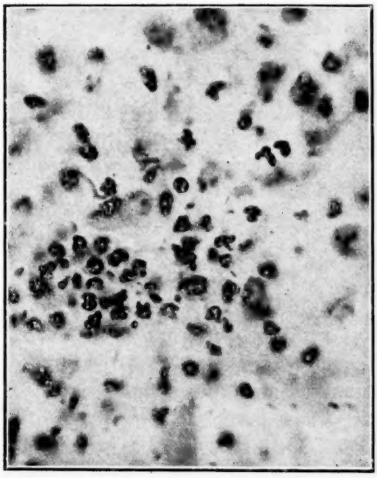
No. 9.

Perivascular cuffs in Hippocampus region. Case 6.



No. 10.

Area showing diffuse infiltration with polymorphs; and round cells, Hippocampus region. Case 6.



No. 11.

Same as No. 10. Higher magnification showing organisms in the lesion, staining gram-Jensen.

XUM

fairly thickly studded with Bunostomum lesions. The right middle-ear contained about half a c.c. of think, yellowish, odourless pus. The cerebro-spinal fluid was somewhat cloudy, the brain was possibly a little hyperæmic, but otherwise macroscopically normal.

*Southdown.*—Comparatively few trichostrongyles in abomasum, and no manifest lesions. Fairly numerous and apparently recently formed œsophagostome nodules in small gut, and also scattered Bunostomum lesions. No ear lesions; sinuses of head normal. Much cloudy mucus in nasal cavities, but no obvious relation between this and the symptoms shown. Cerebro-spinal fluid markedly cloudy. Brain again possibly a little hyperæmic, but otherwise macroscopically normal.

In each case portions of several parts of the brain were taken for sections. Blood, cerebro-spinal fluid, and brain substance were cultured together with the pus from the Romney's middle ear. Cerebro-spinal fluid and samples of blood were also collected for analysis, etc.

The blood and spinal fluid analysis gave the results shown below:

| *Blood.* | *Romney.* | *Southdown.* |
|---|---|---|
| Sugar ... ... | 0.100% ... ... | 0.210% |
| Differential Count: | | |
| Polymorphs ... | 41 ... ... | 58 |
| Lymphocytes ... | 57 ... ... | 40 |
| Mononuclears ... | — ... ... | 2 |
| Eosinophiles ... | 2 ... ... | — |

(Other constituents normal in each case.)

| *Cerebro-spinal fluid.* | *Romney.* | *Southdown.* |
|---|---|---|
| Pandy globulin test | xxx | xxx (large fibrin clot in 24 hours) |
| Sugar ... ... | 0.069% ... ... | 0.170% |
| T.N.P.N. ... | not done ... ... | 25 |
| Chlorides (NaCl) ... | not done ... ... | 700 |
| Leucocytes ... | 290 per c.mm. ... | over 1360 per c.mm. |

Examination of brain sections showed lesions as follows:—

*Romney.*—Some œdema and cellular (round cell) infiltration of meninges, and some perivascular cuffing in cerebrum (Photographs 7 and 8).

*Southdown.*—Meningitis as in the case of the Romney, but much more marked, with definite perivascular cuffing of the vessels in the meninges as well as in the brain substance. The hippocampus showed marked perivascular cuffing, the cells of the cuffs being poly-

morphs and lymphocytes. Scattered throughout the hippocampus were aggregations of round cells and polymorphs, the latter predominating, and in many of these lesions, short, gram-positive organisms were present, which appeared to be rods rather than cocci in process of division (Photographs 9, 10 and 11).

Cultures from these two cases gave organisms as follows :—

*Romney*.—Middle ear, a streptococcus ; blood, a diplococcus, morphologically resembling that from the Te Kuiti case ; brain, a gram-positive rod.

*Southdown*.—Blood, a diplococcus similar again to that from the Te Kuiti case, and, in addition, a very long chained streptococcus. Brain, a diplococcus resembling that found in the blood cultures.

It will be noted that the gram-positive bacterium seen in brain sections from the Southdown was not obtained in culture. The probable explanation would appear that the portion used as inoculum had no lesions in it, since both aerobic and anaerobic media were sown out.

The strains of gram-positive diplococci derived from the Romney's blood, Southdown's blood and Southdown's brain were of interest in view of their resemblance to the organism obtained from the cerebro-spinal fluid of the Te Kuiti case, and which was pathogenic for the sheep and rabbit. In addition to a close morphological resemblance, the appearance of colonies on gelatine (not liquefied in fourteen days) and on serum slopes was entirely similar. The "Romney Blood" and "Southdown Brain" strains, however, were each inoculated intravenously into rabbits in doses of 2 c.c. 24-hour broth cultures, without producing any ill effect, and the gram-positive organism from the Romney brain was similarly innocuous.

## Discussion.

From the prevalence of perivascular cuffing, and the similarity of many of the symptoms to those described as occurring in cases of Borna Disease (enzootic meningo-encephalitis of animals), the possibility that this disease is caused by a filtrable virus, and that the polymorphonuclear aggregations discovered in the brain of some of the cases are due to secondary infection, must be borne in mind. No opportunity has yet occurred due to the paucity of living cases coming forward for investigation, to subject this possibility to experimental trial by intra-cerebral inoculations of brain substance into healthy sheep, but it is hoped that such opportunities will occur next season. A very large number of sections from all the available cases have, however, been examined for the presence of any inclusion

bodies in the nuclei of the neurons analogous to those of Negri or of Joest and Degen, but without success.

The examination of the blood and cerebro-spinal fluid of the three naturally occurring cases which have been received here alive, clinches the microscopical findings in the brain sections. In each case the blood shows a high sugar content—a common concomitant of infective processes—and the differential leucocyte count shows marked increase in polymorphs, and almost entire absence of eocinophiles and basophiles. Thus strong presumptive evidence is present that the animal's illness is infective in nature. The presence of globulin and an increased cell count in the cerebro-spinal fluid, especially when considered in the light of the symptoms manifested, are definite evidence that the infective process indicated by the blood examination is centred in the brain or its coverings.

A point which may not be without significance occurs in a comparison of the blood and cerebro-spinal fluid findings in these natural cases, with those in the sheep and rabbit inoculated with the organism from the Te Kuiti case. The rabbit was inoculated intravenously, and shows similar changes in the blood and cerebro-spinal fluid to those found in the natural cases. The sheep was inoculated intra-spinally, and shows a similar cerebro-spinal fluid, but the blood changes, so marked in the others, are comparatively absent here ; the sugar content is within the normal range according to our findings in New Zealand, and the proportion of polymorphonuclear leucocytes to lymphocytes is not grossly abnormal. One may perhaps draw a very tentative conclusion from this that it is by way of the blood stream that the infection reaches the central nervous system.

Nothing definite can be said regarding the bacteriology of the condition at present. The evidence so far certainly suggests an organism as distinct from a filtrable virus as the agent responsible for the brain lesions. It seems at least probable that the diplococcus derived from the cerebro-spinal fluid in the Te Kuiti case was involved in that particular case, and on looking over the literature available here regarding somewhat similar conditions in domestic animals, one is struck by the frequency with which organisms of this type have been isolated by various investigators as the probable cause of the condition. However, although a somewhat similar organism was obtained from the " Southdown " case, not only did it prove to be non-pathogenic for the rabbit in very heavy doses, but the lesions present in certain brain sections from this case showed the presence of a distinct rod in considerable numbers, and no diplococci could be discovered. It may well be that the infection is no more specific

than are purulent foci in other organs, for the brain lesions in which organisms have been detected are, in reality, minute areas of purulent degeneration.

Curative treatment can be disregarded as being obviously useless, and the major problem to solve, in order that prophylactic control measures may be evolved, is how and whence the infection gains access to the tissues. The possibility of the original focus being the middle ear has always been borne in mind, but with the single exception of the "Romney" case, lesions in this situation have not been found this season, nor in previous years, although a search was always made. One is, therefore, inclined to class the Romney as an atypical case. The œdema and suffusion of the conjunctiva of one or both eyes is not seen till after the manifestation of nervous symptoms, and is presumed to be a sequel to the occurrence of brain lesions. There has been some nasal catarrh in each case, but since so many sheep are affected in this way, particularly in the late summer and autumn, it is probably coincidental. Moreover, there is no apparent connection, and if infection had spread from the nasal cavities *via* the lymphatics, it is difficult to explain the presence of the most definite and numerous lesions in the region of the corpus striatum and the comparative absence of any pathological changes in the olfactory lobes, which is the writer's experience in the few cases dealt with. Although in the Te Kuiti case no evidence of recent parasitic lesions were found in the abomasum or intestines, the other three cases all showed recent Bunostomum lesions, or œsophagostomum nodules, or both. Admittedly these cases were all from the same farm, and probably a large percentage of the other sheep in the flock would have shown similar lesions, but several Government veterinarians who have held post-mortem examinations on such cases from time to time have stated that a heavy infestation with various helminths is the rule. While such lesions may provide a portal of entry for organisms having a predilection for the brain, that this actually occurs is well-nigh impossible to prove or to refute. Moreover, one expects a heavy infestation with helminths in sheep of this age, especially in the autumn, when the feed is going off.

Although no account of this disease is to be found in the literature at the writer's disposal, it is felt that it must occur elsewhere as well as in New Zealand. In fact during a recent visit to Great Britain, a case which it is confidently felt was of this nature was seen in Wales. As in the cases seen here no macroscopic lesions to account for the condition were found on post-mortem examination, but no brain sections were made, nor was the blood or cerebro-spinal fluid examined.



XUM

It is proposed to continue the investigation next season, and this progress report is offered in the hope that others who may have investigated the condition will communicate with the writer and give him the benefit of their experience.

The name "Circling Disease" is obviously inadequate, but it would seem best to await a fuller knowledge of the condition before suggesting a more appropriate one.

**Summary.**

A meningo-encephalitis affecting sheep in New Zealand is described, and details are given of the cases which have come under investigation to date.

The symptoms shown point to the brain or its coverings as the site of the lesions. These are found to be in the form of microscopic purulent foci and perivascular cuffs. The cerebro-spinal fluid is found to contain globulin and a greatly increased cell count, and the blood shows a raised sugar content and marked increase in the polymorphonuclear leucocyte count.

Some account of the bacteriological findings in the cases investigated is given, and the possible channels of entry discussed.

It is desired to correspond with others who have had experience of the condition.

---

# THE POULTRY INDUSTRY: A NEW FIELD FOR THE GENERAL PRACTITIONER.

By NORMAN HOLE, B.Sc., M.R.C.V.S.

*Veterinary Laboratory, Ministry of Agriculture, Weybridge.*

FEW veterinarians realise to-day the vast importance of the poultry industry to Great Britain. It is a most prolific source of food-supply; its monetary value can be estimated by the enormous amount of invested capital it represents; its economical radius is considerable, in that it demands the supply of cereals and other foodstuffs, the employment of labour, and the manufacture of a wide variety of specialised goods; its manurial assets, and its value in the control of insect pests on fruit farms have only recently been recognised. In the course of recent years the industry has been steadily increasing, and it has nearly doubled itself in the short period of nine years. The figures available are very interesting, for in 1921, the Ministry of Agriculture[1] estimated that there were twenty-four million fowls in England and Wales, whilst in 1930, the same authority compute the number as between forty-seven and forty-eight million head, these figures exclusive of poultry on holdings of less than one

acre. Including ducks, geese and turkeys, the figure for 1930 approximates fifty-three million. It is instructive to compare the live stock figures of 1928,[2] in which year there were estimated to be forty-three and a-half million poultry, sixteen million sheep, six million cattle, and three million swine, in England and Wales. It is impossible to represent the value of any industry in hard figures, but by placing a conservative estimate of seven shillings and sixpence on each bird, the face value of the livestock of the poultry industry to-day is approximately represented by the enormous sum of twenty million pounds.

There are many obstacles in the road of successful poultry farming, but the chief is undoubtedly disease. Some losses are bound to be experienced on the best managed and equipped farms, but infectious diseases yearly take an enormous toll, and frequently render poultry farming unprofitable. Infectious disease in poultry could, to a large extent, be controlled and finally eradicated were only proper preventive measures applied when it first appeared. The annual losses in rearing alone from Bacillary White Diarrhœa, Coccidiosis, and Gape Worm Disease, must be enormous, although it is impossible to obtain figures. It is highly probable that many outbreaks are never diagnosed as disease, the losses being attributed to errors in management. Fowl Pox is quoted[3] as being a widely disseminated disease in adult poultry in Great Britain, although there is now available a vaccine found to be an efficient preventive. Avian tuberculosis is a slowly progressive disease of tremendous importance, not only to poultry but also to the pig industry, and, to a lesser extent, to human beings. Beller[4] states that 50% of pigs condemned for tuberculosis at a Berlin abattoir were found to be infected with the avian bacillus, and Van Es[5], in Nebraska, reports that as many as 88% of cases of tuberculosis in swine were found to be of avian origin. It is of interest to note in this connection that 75% of poultry produce in this country comes from general farms, and it is mainly in this direction that future expansion will take place. It is obvious, therefore, that the control of avian tuberculosis is a problem of ever-increasing importance to the pig as well as to the poultry industries. Although there is a valuable preventive vaccine against Fowl Typhoid, this disease decimates the poultry flocks in parts of Wales, and the post-mortem records at the Ministry's Veterinary Laboratory, Weybridge, indicate that the disease is spreading into various parts of England. Outbreaks of Fowl Plague and Fowl Cholera do occasionally occur, and Newcastle Disease, should it break out, as in 1926,[6] might well spread with enormous loss, unless it was immediately diagnosed and drastic preventive measures were taken. It is of interest to note that this disease in the Dutch East Indies[7] accounted

for the loss of many millions of fowls in a short period, in fact it eradicated for a time poultry from those islands.

Unfortunately, there are between the veterinary surgeon and the poultry farmer several barriers which are difficult to surmount. The question of fees is one of the foremost to be considered. Even if it were a sound policy, which it is not, the actual treatment of individual fowls is definitely barred to the veterinary surgeon, for no poultry farmer would be prepared to remunerate him adequately for such work, unless the patients were very valuable. The practitioner, therefore, must of necessity confine himself to practical demonstration and to advisory work. Until recently the veterinary surgeon showed no interest in poultry pathology. In many cases this was regrettably due to an actual lack of knowledge of the subject.

*It may be said that as a result of the apathy shown by the veterinary surgeon, the poultry farmer no longer regards him as the authority to whom he should take his troubles, and we see, instead, unqualified and inexperienced persons doing work in the poultry industry on subjects to which the skill of our profession alone should be applied. Not only the ignorant, but people with a general but quite unsuitable scientific education, are carrying out pathological work in which they have had neither training nor experience.*

This interpolation on the part of charlatans is very far reaching in its effects. *Empiricism is a stigma to the veterinary profession, and it is the duty of every veterinary surgeon to endeavour to stamp it out.* It affects the poultry farmer in that he is frequently misled by incorrect diagnoses, and instead of getting his trouble under control, as a result of suitable advice, he is worse off than before, following a false trail and getting further away from his goal. The writer has been astounded by the number of cases he has met in the course of routine poultry diagnosis work, in which infectious diseases of serious import have been previously described by an unqualified adviser as cases of " worms." A few worms are commonly found in the intestines of healthy birds, and worms may be ignored as a cause of death unless present in very large numbers, and even then it is probable that they have often obtained the upper hand only as a result of some debilitating disease. Another form of empiricism to which the eyes of the poultry farmer should be opened by suitable veterinary advice, is the sale of proprietary preparations and chick foods, which are described as " Specific against Bacillary White Diarrhœa," or some other disease. There is no such specific yet discovered against Bacillary White Diarrhœa. The source of infection lies not in the food, but in the eggs from which the chicks were hatched, and it is only by ensuring the

absence from the eggs of *Bacillus pullorum* that freedom from Bacillary White Diarrhœa is assured. A little knowledge would show the poultry farmer how groundless such claims must be. An appreciable number of outbreaks of Bacillary White Diarrhœa have been diagnosed by the writer, about which a history was received from the owner, who stated: "It cannot be Bacillary White Diarrhœa, as I have fed such and such a B.W.D. specific since hatching." Another line in which unqualified workers have secured a firm hold is the agglutination test for the detection of adult fowls infected with the *Bacillus pullorum*. This test, properly carried out and correctly interpreted, has been found to be a reliable method of ensuring the freedom of the hatching eggs from Bacillary White Diarrhœa. A large number of these tests are carried out annually at reliable laboratories, but an enormous number are performed by unqualified or inexperienced workers, whose results are comparatively worthless. The evil accruing from this valueless testing is two-fold: an unsuspecting poultry farmer is persuaded that blood-testing is of great value, and he submits his stock birds to an inefficient test; his chicks die of Bacillary White Diarrhœa, and a reliable method of prevention unjustly gets a bad name. To the writer's knowledge, in some cases whole blood is mixed with antigen (usually imported, or indiscriminately sold by a biological product firm) on a glass plate, and the results judged by the naked eye of a layman—sometimes the poultry farmer himself, or his poultryman. The value of the whole-blood test in expert hands, compared with that of the serum antigen test, is a matter of opinion, but in the hands of the inexperienced it is worthless. To such an extent has this test been abused that a guarantee of stock having been "blood tested" carries not the slightest weight at the present time in the poultry industry, unless it can be shown that the testing has been carried out at a reliable laboratory.

It has been previously mentioned in this article that the treatment of sick fowls is not a sound economic proposition, owing to the high cost of labour and the relatively small value of the individual bird. It would be the duty of the veterinary surgeon to ascertain whether infectious disease was present, and, if so, to advise his client what steps should be taken to prevent its further spread, and to bring about its speedy eradication. Owing to the small value of individual fowls a wholesale destruction of "in-contacts" is more practicable, and the eradication of a disease in poultry should be a far simpler matter than in the case of other domestic animals, which may be worth thirty or forty pounds apiece. Except in diseases showing characteristic lesions such as Tuberculosis, Fowl Pox and Blackhead,

XUM

diagnosis is unfortunately a matter for a worker with full laboratory facilities, but this fact should not prevent the practitioner from using his general knowledge of infectious disease, to advise the wisdom of a laboratory examination, or from sending material for such an examination. There are several reliable laboratories where such work is carried out for a reasonable fee. The demonstration of blood-taking, inoculating against Fowl Pox or Fowl Typhoid, Tuberculin testing, etc., are other departments worthy of the attention of the general practitioner, and advice on the principles of disinfection and hygiene is always necessary in both health and disease. As previously stated, 75% of the poultry produce comes from general farms. It would be to the advantage of the veterinary surgeon to take an interest in the poultry when visiting on other business, for even if no fee resulted at the time, it would enhance his reputation as a veterinary surgeon, and open up to the farmer a source of information and advice in time of need.

Much has been said in this article about poultry diseases and their mismanagement. Many readers will ignore the article, considering the subject unworthy of their attention. But these sceptics should remember that poultry farming is considered by competent authorities to be without question the most profitable branch of agriculture to-day, and it is still growing; there is room for almost unlimited expansion, as the industry fails by twenty-seven million pounds annually to supply the home market. The business conclusion is obvious. Putting this aside, it is a fact that the absence of professional advice and assistance in controlling disease is seriously hindering the normal expansion of the industry in this country. More attention and teaching at the Veterinary Colleges could justifiably be given to poultry diseases, especially with the introduction of the five years' course. America has increased its number of birds enormously in recent years, but through past inattention, disease is getting out of hand. Surely in this country the time has come for the veterinary profession to cast off its apathy and take up the matter of poultry pathology, in order to assist a great national industry and to enlarge the field of the general practitioner, which, in this mechanical age, is slowly becoming more and more restricted.

REFERENCES.

(1) *Agricultural Market Report*, 1930, Vol. XXVII, No. 43.
(2) Annual Rep. Proc. under Diseases An. Act, 1928.
(3) Doyle, T. M.: *J. C. Path. Thera.* Vol. XLIII. P. 40, 1930.
(4) Beller, K., D.T.W., 1930, 38, 29. P. 453.
(5) Van Es., Un. Nebraska Expt. Sta. Cir., 25, 1925.
(6) Doyle, T. M.: *J. C. Path. Thera.*, 1926. P. 144.
(7) Picard, W. K., Dep. Agric., Dutch E. Indies, Vet. Bul. No. 65.

XUM

# THE WORK OF THE VETERINARY SCIENTIFIC RESEARCH INSTITUTIONS IN THE SOVIET REPUBLICS.*

## FOOT AND MOUTH DISEASE.

BEFORE the revolution no organised fight was carried out against foot and mouth disease. The disease was a permanent and customary occurrence in daily life, without any limitations and obstacles. To the occurrence of the disease all were accustomed, so that no one ever thought of preventing its spread, and no veterinary surgeon was interested to find its origin and to arrange an organisation for stopping the spreading of the disease. Also foot and mouth disease in scientific and research work has not gained much (*i.e.*, the work of the commission of Profs. M. Ekerta, Deduleana, and Koneva, etc.)

After the foundation of the Soviet Veterinary Service, which started to inquire into the causes of animal diseases, gradually the question of foot and mouth disease was also taken up. In 1927, in the Government Institution, a scientific and research work in foot and mouth disease was undertaken by Prof. C. M. Vesheleskovo. Experiments were done on this subject, and articles were published in the German and French journals.

In 1928 it was decided to build two institutions for special research into this disease, and in August, 1929, 815,000 roubles was given by the Savnarkom R.C.F.C.A. for this purpose (this money does not include the purchase of the technical and special instruments). The place selected for the Institute was the island Govodomlis, on Lake Celeager.

The area of the island is 290 hectares. The fact that the island is not far from the cities of Ostashkov, Leningrad, and Moscow, is of great value to the Institute. Also, this island is a very beautiful place. It has a marvellous forest, and an inland lake with two small islets. The climate is dry and healthy (till recently here was a very large rest home for the people).

The communication with the City of Ostashkov in summer time is by means of motor boats and ships, and in winter by means of horses ; and Ostashkov has a communication with Leningrad and Moscow by means of the railway.

The Institute for foot and mouth disease will be comprised of a series of specific and other buildings, and the area occupied by all of them together will be 53,000 cubic metres.

* BECTHNK-COBPEMEHHOV-BETEPNHAPH. No. 12 (109), 1930. Translated by Nathan Fiurun.

XUM

### The Main Building.

The main laboratory will be of two and a-half floors, and will include the research and scientific laboratories, museum, library, the office of the Principal, etc. On one side of this building will be attached the building for post-mortem examinations, and the special rooms for the observation of the animals, and for preparing them. It will include a yard for 200 cattle, and a place for 60 pigs.

On the other side a building for 27 large experimental animals, and also for 500 guinea-pigs. The cattle yard will be built on the Valfsherenbursk system, where in a special way are removed the discharges of the animals; and the building for 27 large experimental animals will be built on the Alforskoi system. All these buildings are placed in such a way as to form one closed quadrangle. This is done for the purpose of forming an absolute assurance that the infection shall not spread outside the quadrangle. For the same purpose the way leading in and out from these buildings will have specially arranged "passages," which will contain dressing rooms and hot douches. Everyone when entering the laboratory buildings or into the cattle yards, will have to pass through a "passage" to change his underwear, and put on a laboratory dress; also, when coming out, he will have in one dressing room to leave the laboratory dress and take a hot bath, and in a second dressing room to dress in his own clothes; and only then can he leave the building.

The cattle, which will be brought in for experimental work, or for manufacturing purposes, after being used, and passing the quarantine period, will be slaughtered for meat, and only if in a healthy condition will they be passed for food. The feeding and removal of manure in the cattle yard and in the buildings of the experimental animals, will be done mechanically. The carcasses will be burned by the system of Koru.

All the buildings in the quadrangle will be warmed by a central heating system, and will have a pipe-water supply, lavatories, electric light, gas, and communication all over the building by telephone; there being also a telephone communication with all the houses on the island, and with the City of Ostashkov.

In addition to the quadrangle building, on the island will be built an isolation place for 60 cattle, and a breeding house for 5,000 guinea-pigs, and other buildings for administration and housing. The dwelling houses, or flats, will be for 200 people. Each house will be of two floors, with all the comforts for living; a special house will be built for a club, with a theatre, having room for 200 people; rooms for amusements, libraries, and children's room, etc. And in the same

building it is intended to make the communal dining room. Not far away from the club will be the sports ground, on which will be planted trees and flowers. On the island will be arranged a mechanical laundry, bath, and a small cemetery.

For communication purposes on the lake, such as bringing of cattle and food, will be arranged its own water transport, and there will be built two landing places: one for ships and big boats, and the second for motor boats. The Institute will be in communication with the City of Ostashkov by a cable of 1,500 metres in length, running under the water. The special instruments for the Institute are already ordered from abroad, and it is hoped that they will be ready by the time that the buildings are completed. The production of immune serum will be also mechanically done, so as to cheapen production. The construction of the Institute is already in full swing, and it will be finished at the beginning of 1931.

### The Fight Against Foot and Mouth Disease.

Among the cattle of Kolchoze district there was an outbreak of foot and mouth disease, with all the clinical symptoms, and the the question was how to stop it spreading. The method of Prof. Deduleana, and of the latest literature, is not effective, so having my own results, and the records of previous years, I applied the following method: I took the milk of a diseased cow which showed all the clinical symptoms of the disease (the cow was at the third day of infection). This milk was unboiled, and was injected into healthy cows subcutaneously, using a syringe of 20 grammes size. The cows which had been injected with the milk, on the second and third day became sleepy, lost appetite, rumination was decreased, and there was also decreased lactation. On the seventh day the cows appeared better: they ate normally, and the yield of milk increased.

As a month had passed since the outbreak of the disease and not a single cow became infected with foot and mouth disease, we may conclude that inoculation of unboiled milk from a diseased cow gives satisfactory results.

### A Record of Experimental Work for the Study of Foot and Mouth Disease, under the Auspice of A. L. Shomorachov.

In No. 12 of this Journal for 1928 was published the positive results obtained by the veterinary surgeon Kersanov, when he vaccinated healthy cattle against foot and mouth disease with the milk of infected cows. The milk he injected subcutaneously; 60 c.c. were injected into cows to prevent them becoming infected, and 40 c.c.

XUM

into cows for therapeutic purposes ; and according to his observations both these quantities were satisfactory.

To confirm his statements, we carried out two experiments: The first was when foot and mouth disease was revealed amongst 56 cattle brought into the district of Moscow ; 20 of the animals were infected with the disease, and 36 were absolutely healthy. For the experiment we took 18 healthy animals and 18 affected ones.

Therefore we injected 18 animals absolutely healthy so as to prevent them becoming infected. A second group of 18 diseased animals were also injected with milk for therapeutic purposes. Measures of precaution were taken to prevent the healthy animals from becoming directly infected by diseased animals. The healthy animals were put so that they could not come into contact with the diseased animals: the healthy animals had separate places for drinking, and separate men were looking after them.

The milk for the experiment was taken from two cows: (1) When the milk was taken the cow's temperature was 41.2° C., and had many vesicles in the mouth and clapt regions. (2) When the milk was taken from the second cow, she had a temperature of 40.6°C., and had many vesicles in the mouth region only. The milk immediately after being drawn was injected into the cows in the same quantities as stated previously. In the first group of animals the milk was injected on April 29th. Only 14 cows were injected, the remainder being used for control purposes. In the second group only 14 cows were injected, four being left as controls. Amongst the fourteen injected of the second group, in six only was the temperature slightly raised without any clinical symptoms. These observations were made during the first 10 days ; afterwards, only once a week during one month.

On April 30th, the second day after injection, no evidence of swelling was seen at the place of injection in either group of animals. The temperature of the animals in the first group remained normal.

On March 1st one cow showed all the clinical symptoms of the disease. On March 2nd, three cows were ill ; on March 3rd, one cow was ill ; on March 4th, seven cows were ill, and on March 5th the last two cows became ill. The animals which were left for control became ill between the third and fifth day. There was no difference in the clinical symptoms between the vaccinated and the control animals.

Of the second group of animals—which were vaccinated at the beginning of their illness, the results obtained were as follows: Six animals which were vaccinated with the milk immediately their temperatures began to rise, all became ill and showed full develop-

XUM

ment of all the clinical symptoms of the disease. The remaining cows were all clinically ill; the injected milk produced no therapeutic effect.

The second experiment was made in the summer of 1929, when an outbreak of foot and mouth disease was revealed in a herd. For the experiment 70 head of cattle were taken from a herd absolutely free from infection. To obtain milk from an infected cow, two cows were infected artificially and the milk taken the moment the infection became generalised, the animals having a temperature of 41.1°C.

On August 14th the healthy animals were vaccinated after their temperature was taken, and they were tested clinically. On the fourth day after vaccination, amongst the cattle which were chosen for the experiment, three cases became ill, and showed clinical symptoms of foot and mouth disease. On the fifth day two other cows became ill. After this we thought that there was no object in continuing further observations, and we artificially infected the rest of them, so as not to prolong the experiment.

On July 19th in the same herd was gathered the foot and mouth virus, and on the same day all the animals which still remained healthy were artificially infected. The result after four days was that out of the 35 animals which were injected with the milk and were artificially infected, we had clinical disease in 32 animals, three only remaining healthy. And so with our smaller experiments, we could not confirm the results which the veterinary surgeon Kersanov made from his practice observations.

The results are: (1) Fresh milk (unboiled) from infected animals with foot and mouth disease which was taken from them at the moment of infection, and this milk when injected subcutaneously into healthy animals in quantities of 60 c.c. does not make them immune to foot and mouth disease. (2) The same milk injected subcutaneously into animals already sick in the quantity of 40 c.c. for therapeutical treatment, does not produce any curative effect.

---

## OBSERVATIONS ON THE INJECTION OF CALCIUM GLUCONATE

**By H. S. CALDWELL, M.R.C.V.S., D.V.S.M. (Vict.)**
*Newcastle, Staffs.*

THERE have been many reports recently on experiences with calcium gluconate in the treatment of milk fever. It is not intended to discuss here the merits of this line of treatment, but to describe some unpleasant sequelæ. A few weeks after adopting this treatment I was full of praise for it, the cases did remarkably well after one

large dose (three ounces in two pints of water) and there seemed to be no disadvantages to its adoption. Soon after, however, messages began to arrive, reporting swollen necks, loss of milk, etc. A great majority, on careful inquiry, showed no ill effects, but the others made one consider what steps could be taken to evolve a satisfactory technique. The method now employed is described later.

**I.—Abnormalities Observed in the Neck.**

(*a*) *Small swellings* around the areas of injection, hard, immobile, slightly painful, without pus formation. Several such cases were seen, the swellings persisted up to a few weeks, gradually subsiding, and there was little or no interference with general health.

(*b*) *Larger swellings*, which feel very hard and deeply seated, slightly painful, without abscess formation, softening or pointing. Three cases were observed of such swellings, which persisted two to three months, the owners reporting from time to time their progress. Counter irritants in one case did not alter the character of the enlargement, and exploratory puncture in one case yielded only a few drops of sanguineous serum. The cows had rather stiff necks, but showed no loss of condition or milk yield.

(*c*) *Large, diffuse, painful swellings* were observed in two cases, spreading to the brisket and shoulder, and in one case to the knees. The main body of the swelling, around the points of injection, was hard, but the surrounding area œdematous. Exploratory punctures yielded no evidence of pus. When lanced, a thick subcutaneous layer of inflammatory tissue was discovered, beneath which were sinuses containing thin, reddish-brown, odourless, sero-sanguineous fluid. This fluid was not copious ; it contained yellow clots varying in size from specks to several inches long. After some days the discharge became purulent. In each of these cases there was rapid recovery from milk fever and the neck was not noticed to be swollen for some weeks afterwards, and in each the enlargement was much greater on one side of the neck than the other, although equal amounts of solution had been injected on each side. In one case treatment was by long incisions, in the other by setons. Both cows lost flesh and gave less milk, until, in about three months, the lesions had healed ; afterwards the animals grew well.

(*d*) *Pyogenic infections.*—In two cases simple subcutaneous abscesses were seen. Each cow had two simple abscesses at injection points, prominent, soft, pointing swellings. On lancing, a thick, pale, creamy pus drained out. Healing in these cases was rapid and complete without further attention.

XUM

### II.—Abnormalities in General Health.

(*a*) *Pyrexia.*—A cow was treated for milk fever, and the following day was up and normal in gait, but her temperature was 106° F. A further injection (of one ounce in one pint) was given, during which procedure she commenced to sweat and blow. Next day the cow was normal in every respect, and remained so.

A similar case occurred at the same farm a fortnight afterwards. When first seen the cow was staggering about with milk fever, but she did not go down. Three days after treatment her temperature was 105°, she was blowing, sweating, and off feed. There was slight thickening of the neck. The cow was quite normal the following day and has not had any further ill effects.

(*b*) *Stiffness.*—The owner of one case treated reported that the cow walked stiffly in all her limbs: there was no enlargement of the neck. Stiffness persisted for four months, then "the cow did well, and is now all right."

### Method Now Adopted Without Any Ill Effects.

The solution referred to in these notes is made with calcium gluconate (Sandoz) granules in water. Two ounces in two pints of water are injected at first, followed in all cases by at least one further injection of one ounce in one pint. The solutions available in ampoules are, using advisable quantities, too expensive for routine use.

The calcium gluconate and water are boiled along with a bottle, tun dish, and syringe, for some minutes. The solution is filtered, hot, through filter paper into the sterilised bottle, which has a narrow neck (to minimise the risk of contamination of the fluid during injecting). In my experience the solution is absorbed more rapidly when injected at 80–90° instead of body temperature. A bath thermometer is always used before injecting. It is not advisable to cool the solution by pouring into bowls, etc., a solution can be prepared and kept in the stoppered bottle, and warmed up to a suitable heat when required. In cold weather the calcium gluconate crystallises out of solution, it should then be boiled and filtered again. The cow's neck is washed with hot water and disinfectant before and after injecting. A Higginson syringe is used, with a needle adaptor in place of the rectal tube. A sharp, large bore needle makes the operation more speedy. The bulb of the syringe is compressed three times in each site, this necessitates about five sites on each side of the neck, and the fluid is dispersed by massage before withdrawing the needle. I have not found any advantage in injecting into any particular area of the neck; near the poll the solution is apt to be more slowly absorbed; near the scapula the worst swellings were observed formerly.

XUM

# Clinical Articles

## Forced Exercise in the Treatment of Lameness.

By D. E. WILKINSON, M.R.C.V.S.
*Chigwell.*

THE recent publication of a little work entitled "Shorter Convalescence," by Lieut.-Colonel McConnell, bio-physical assistant (working at St. Thomas's Hospital), calls attention to the benefit obtained by stimulating the patient's "will-to-do" exercises for the restoration of functional activity after injury, especially to the joints.

One such case came under the writer's notice a few years ago in the person of a hunting man who sustained a fracture of the lumbar vertebræ through a bad fall, and who recovered sufficiently to be able to walk quite well with the aid of a stick, after lying in bed paralysed in both lower limbs for two years. In his case he always swore he would both walk and ride again, and spent hours daily in applying massage to his paralysed and atrophied legs with that aim and end ever in view.

Whilst his patients do not, as a rule, lend themselves to auto-suggestion, the fact that all medical or surgical remedial measures have as their aim the restoration of function, should incite the veterinary practitioner to adopt such a line of treatment as will bring the parts affected to work again with their original vigour and vitality.

The forces which militate against the restoration of function following the repair of injuries in veterinary patients are principally those exercised by the formation of callosities and adhesions, or in cases of long enforced idleness, of disuse atrophy.

Unfortunately, it is not uncommon for treatment to be abandoned before a cure is effected, sometimes from motives of false economy, sometimes because owner or veterinary attendant, or both, have become weary of a long course of treatment which shows no spectacular improvement.

It is the writer's carefully considered opinion that in equine practice many disappointments are occasioned by the common practice of turning horses convalescent from acute lameness or injury out to grass, hoping, doubtless, that whilst a considerable saving of stable costs is effected, "nature" will take a hand in the process

of repair, and the patient will return sound to work after a longer or shorter period of "rest"; the practitioner meanwhile lulling his uneasy mind to sleep by murmuring to himself some old saw about *vis medicatrix naturæ*, and forgetting that physical rest, which is merely idleness, is very frequently something entirely opposed to physiological rest.

Some forty or fifty years ago the head of an important firm of cartage contractors in Liverpool, who kept a very valuable stud, noticed that many of the big fine young Shire horses which fell lame in the heavy work in the city and docks, after being sold to farmers and worked on the land for a year or two, became quite sound, were sold back into Liverpool, and worked for years.

The cause of lameness in many of these heavy horses was probably strain of the collateral ligaments of the pasterns, resulting in periostitis and bony enlargements accompanied by fibrous adhesions, sometimes amounting to a fibrous anchylosis, and often complicated by contracted feet. The treatment usually adopted was firing, blistering, and a run at grass: then, as this seldom resulted in a cure, the horses were sold.

As the head of the firm was extremely fond and proud of a high-class cart horse, and paid big prices for them, his resultant loss was heavy. Being a shrewd and observant man, he noticed the return of some of his horses to the city after a course of work on the land, and being convinced of the soundness of this line of treatment, he bought an arable farm on the outskirts of Liverpool which he worked with the young horses which had fallen lame "on the stones," returning them to their city work as they recovered. His successor in the London branch of the business assured me that this outlay proved a considerable financial success.

For this latter gentleman I kept and managed a stud of hunters for three seasons, and as he was a heavy, bold man who liked a five-hundred-guinea horse for a sixth of that price, my stable was generally well filled by what the dealers euphemistically term "seasoned hunters," meaning, in this case at least, high-class horses, past their prime, whose unsoundnesses were manifold, and whose various bony and bursal enlargements, callosities, and fibrosities would have filled the curator of a pathological museum with envy.

A discussion with the owner as to the treatment of the horses led him to relate the above facts to me, as he heartily agreed with my suggestion that to keep them going at all they must be kept very fit and in constant work.

My insistence upon this constant work brought down the wrath

XUM

of a neighbouring stud groom upon my head in the following manner: His master called upon me one pouring wet Sunday morning, and seeing all the horses out at exercise with mackintosh sheets on, exclaimed: "*Won't* you let your horses stand still on a Sunday?" I replied: "No, not after hunting on a Saturday, to come out with legs like millposts on Monday." On his return home he gave instructions that in future all his horses were to be exercised on Sunday, and his stud groom reminded me of the fact only a week ago, although the incident occurred in 1912.

The fact that not one of these horses ever missed his turn through lameness throughout three hard seasons, although two of them always came up lame from grass in the autumn, and they always hunted with draghounds on Saturdays, and often with foxhounds on the following Monday, says something for the treatment pursued.

There are few things more exasperating in practice than to treat a horse for lameness, get him sound, have a recurrence of the lameness on his return to work, and then see the owner sell him to someone who puts him straight into regular work and gets him permanently sound as he gains muscular tone and condition; yet this has been the writer's experience on several occasions.

Perhaps the most troublesome lameness with which hunters and steeplechasers are affected is sprain of the pectoral muscles. In the acute stage a prolonged rest may be necessary, but once that is past, work must be persevered with if the animal's soundness is to be restored.

One of the most valuable heavyweight hunters in England, lame from this cause, was bought by a hunter-dealing farmer for a few pounds, in quite recent years, and put straight into work on the plough. After three months of this he became quite sound, was hunted hard and kept sound, won in a big class at the International Show at Olympia, and finally changed hands at a sum which was possibly a record for a hunter in this country.

In March last, the writer was called in to see a hunter in the West of England which, following an accident, had been lame for eighteen months. The horse's action, together with the entire absence of anything abnormal in the other parts of the limb, indicated the near shoulder as the seat of lameness. The limb was imperfectly extended, with occasional stumbling and a slight but noticeable amount of abduction during progression, and as there was obvious wasting of all visible shoulder muscles, together with some loss of control of the adductors, a diagnosis of injury to the nerves of the brachial plexus was made. The acute symptoms had obviously

subsided, as there was no pain on palpation or rotation of the limb, and it was decided that no further benefit was likely to result from prolonged rest. The treatment prescribed was lunging for twenty minutes three times each day in right-handed circles, and the owner was warned that this would probably cause a recurrence of the lameness, and necessitate a rest for a few days until it passed off; exercise then to be resumed.

After three days of this treatment the horse fell very lame, had three days' rest, and was then again lunged. This treatment has been continued all the summer, the horse running out and being caught, lunged, and turned loose again. His owner reported recently that he is now quite sound.

This animal had been "resting" at grass for eighteen months with no appreciable improvement in his condition until the forced exercise was commenced. His is one of many cases which have recovered under this line of treatment, which is merely an adaptation of human orthopædics.

The cases for forced exercise must be selected with care, but it is safe to assume that a case fit to be turned out is fit to be exercised, whilst pain or discomfort in movement or in rising when recumbent, may make him decline to take any beneficial amount of exercise of his own volition, whilst the lack of it may lead to atrophy anchylosis, or a passive and chronic congestion.

---

## Hypertrophy of the Submaxillary Gland in the Horse.

By FRANK CHAMBERS, O.B.E., F.R.C.V.S.
*Wolverhampton.*

DURING the past year I have seen two cases of the above condition, which to my mind are of unusual interest. The first, a nine-year-old grey H.D. gelding, was operated on for the relief of sandcrack, and afterwards turned out to grass for two months. He was then fetched up and put to work. After working for a few days it was noticed that a small abscess had come up on the cheek just above the angle of the mouth. It was opened on July 8th, and a teaspoonful of thick pus liberated. It filled up again, and was opened a second time. On July 21st, it was noticed that the submaxillary gland on the right side was enlarged. As the gland appeared to contain pus, it was lanced, but only a little escaped. The wound was syringed out daily with Formalin and Caustic Soda solution (1/2,000) twice daily. Several injections of Staphylococcus and Streptococcus vaccine were given,

but the gland still continued to enlarge. On August 2nd, the gelding was admitted to hospital, and was under treatment until the 13th. Potassium Iodide in 2-dram doses was administered daily, and several injections of a 20% solution of KI were made into the gland itself. The gland was now as big as a small cocoanut, and pus still made its way from the opening that was made on July 21st. Several smears were examined at different times. I had expected to find the streptococcus of Schutz, but was not successful nor was there any sign of the actinomyces. Staphylococci were present, but not in large numbers. I wanted to operate and remove the growth, but the owner decided to sell the animal, as it was surplus to requirements, and I therefore lost sight of the case.

The second case happened in a three-year-old hunter filly. The gland gradually enlarged, but never "pointed" like a strangles abscess. There never was any cough or catarrh or constitutional disturbance that could be associated with an attack of strangles. The gland discharged pus from one small sinus. The enlargment was blistered twice with mercurial blister, but still continued to grow in size. The case was first seen on July 26th. On October 22nd, I cast the filly and removed the mass with very little trouble with the aid of a good local anæsthetic. Hæmorrhage was slight, but the submaxillary vessels were exposed, but not injured. The wound was packed with gauze, which was removed the following day. Irrigation of the wound with the solution above described was carried out daily, and healing was complete in fourteen days. The mass was sent to Professor Hare, who reported that the condition was due to an acute adenitis caused by the presence of a bi-polar staining organism (one of the Pasteurella group). The growth was as large as a cocoanut, and weighed two pounds. I greatly regret that I did not have the pus cultured from the grey, for it was an identical condition to that seen on the filly.

---

## Danger of Pituitrin in Ruminants.

By BERNARD H. BENSON, M.R.C.V.S.
*Hampstead, N.W.*

SOME time ago, in Devonshire, I was asked by the purchaser to examine a cow which had been sold to him warranted in calf. After a careful examination *per vaginum* and *per rectum* I was satisfied as the animal was a month overdue, that there was no calf there.

The Vendor's Veterinary Surgeon examined the cow and was confident that there was a *dead* calf in the uterus. A meeting was

arranged between us. The Vendor's veterinary surgeon again examined the cow, and said he was confident of his diagnosis by the smell of his hands. But he said he would make sure, and injected 5 c.c. of pituitrin. I protested against this, as I could not see what good it would do. However, the result was that the cow began to heave and strain in about five minutes, and continued to do so till she died about forty-eight hours afterwards.

On post-mortem examination with the other veterinary surgeon we found an old-standing metritis. The uterus was, of course, empty otherwise. The bowels were completely empty.

### An Unusual Case of Milk Fever.

I was called to a heifer (first calf) calved three days. A typical case of " milk fever." The heifer was comatose and blown up, as she had been allowed to lie on her side for some hours. I inflated the udder, and found her quite normal when I called again about twelve hours later. This is the first case of " milk fever " in a heifer at first calving I have encountered.

### A Case of "Brilliant Diagnosis"!

I was called to see a small Pekinese Bitch suffering from Paraplegia. The owner had taken it to the " Dispensary for Sick Animals of the Poor." The expert adviser there had informed her that it had dislocated both hips and had given her some powders. Under rational treatment, when I left a week afterwards, the patient appeared well on the road to recovery.

N.B.—The owner of this animal was the wife of a prosperous tradesman, and well able to pay for treatment of her pet.

---

## Observations upon the Pigmentation of the Iris of the Dog.

By W. P. BLOUNT, M.R.C.V.S.
*Derby.*

THE literature upon this subject is scanty. General text-books in physiology refer to the pigmentation of the Iris, but do not specify any arrangement or distribution of it. Halliburton mentions the pigmentation of the Iris, while Noel Paton makes no reference at all; but Sisson, referring to the dog, says: " The Iris is commonly light or yellow-brown, but not rarely has a blue tinge; the colour often differs in the two eyes." Smith gives a similar description; but the best is that by Nicholas in his book " Veterinary Opthalm-

ology," in which he says with reference to pigmentation: "In the dog, brown or golden-yellow (this coloration varies very much in individuals of the same species. In many instances it has some relation with the colouring of the coat and skin. In white dogs it is often bluish-grey in colour. . . . )"

In order to arrive at definite conclusions concerning the distribution of the pigment as seen on the anterior face of the Iris of the dog, the writer decided to make as many observations as possible upon different breeds. Opportunity was taken, therefore, during the Forty-Fourth Championship Show of the Scottish Kennel Club (1927), to make records upon the general colour of the "eyes," the particular distribution of the pigment, and its relation to the colour of the animal; and also upon the condition of the Pupil.

Little difficulty was encountered from the fact that all the animals were under the same environment; the light was good, the dogs themselves in every case docile, scarcely any resistance being offered to a reasonably full examination of the eyes.

*Definitions*—After the first few examinations it was found that it was impossible to classify the Iris as an entity. The pigmentation varied in animals of the same breed, and further, its distribution was seen to be in definite areas: circular bands exhibiting themselves in ring formation at varying distances from the Pupil. It was therefore considered advisable, for the sake of simplicity, to divide the Iris into three zones: (1) An inner circular zone next to the Pupil; (2) a middle band; and, finally, (3) an outer circular zone reaching as far as the Sclera.

Later this classification was, in certain cases, found to be inadequate, because the middle zone was split into one or two additional pigmentary bands; and therefore in some cases it was necessary to divide the Iris into five distinct portions In each case, however, the areas were found to run parallel to the periphery of the pupil, and may be considered as rings of varying widths

The following abbreviations and definitions of terms have been used:—B=brown; Bl= black; D=dark; L=light; M=medium; G=golden; R=red; Y=yellow.

The original observations upon 150 pedigree dogs, including some 28 breeds, were recorded individually; but in this paper it is the intention to refer only to the breeds as a whole. Individual dogs are not recorded, though special characteristics are noted where necessary.

*Method.*—The condition of the Pupil was first noted. Then followed the observations upon the distribution of the pigment as

seen on the anterior face of the Iris, and in addition a special note was taken of the colour of the coat of the animal or other pigmentary feature.

Whenever possible the animal was allowed to remain in a natural position, for it was found that the animals would display their eyes to greater advantage if allowed to remain undisturbed.

**Results.**

Borzois (5 animals examined).—Zone 1=grey. Zone 2=MB, LB, RB or grey. Zone 3=DB to Bl.

Bulldogs (8 animals examined).—Zone 1=dirty grey-brown. Zone 2=MB, RB or GB. A streak of green in one dog. Zone 3=DB to Bl.

Chows (7 animals examined).—Zone 1=dull dirty-grey; LB in two cases. Zone 2=dirty Y, or GY. Zone 3=MB. Zone 4=DB to Bl.

Smooth Collies (4 animals examined).—Zone 1=grey B. Zone 2=LB or LY. Zone 3=MB. Zone 4=very DB.

Rough Collies (5 animals examined).—Zone 1=dirty B. Zone 2=dirty Y. Zone 3=L or MB, possibly GB. Zone 4=DB. Zone 5=Bl ring. Five distinct coats seen here.

Clumbers (5 dogs examined).—Zone 1=dirty B; greeny-grey in one case. Zone 2=Y grey. Zone 3=GY. Zone 4=MB. Zone 5=Bl. The second and fourth areas predominate this breed.

Great Danes (6 animals examined).—Zone 1=dark grey B. Zone 2=LB to MB. Zone 3=DB to Bl.

Dalmatians (6 animals examined).—Zone 1=dirty grey B. Zone 2=YG or LB. Zone 3=MB. Zone 4=DB to Bl. Frequently a goldfish colour is dominant here. One dog possessed a bluey tinge in the second coat.

Irish Wolf Hound (1 animal examined).—Zone 1=MDB ring. Zone 2=grey-green. Zone 3=LB. Zone 4=DB, Bl ring.

Deer Hounds (5 animals examined).—Zone 1=dark dirty B ring. Zone 2=includes some yellow or LB. Zone 3=M to DB; and finally Zone 4=Bl ring.

Elkhounds (5 animals examined).—Zone 1=dirty DB. Zone 2=Y or GB. Zone 3=L or MB. Zone 4=DB. Apparently the lighter the colour of the dog's coat, the more chance there is of the second pigmentary area containing a Y or G colour in it.

Greyhounds (5 dogs examined).—Zone 1=dirty B. Zone 2=MB. Zone 3=DB. Three distinct areas here. Brindle dogs possess some RB, and fawn dogs some Y.

XUM

KEESHONDS (6 animals examined).—Zone 1=dirty B. Zone 2=LB, GB or dark RB. Zone 3=DB to Bl. Puppies of this breed possess extremely dark eyes, and as no adult appeared similarly dark it is assumed that with age the colour of the Iris changes.

LABRADORS (5 dogs examined).—Zone 1=dark dirty B. Zone 2=LYB. Zone 3=DB to Bl.

NEWFOUNDLANDS (7 animals examined).—Zone 1=dark chocolate B. Zone 2=LB. Zone 3=DB or Bl ringed.

POINTERS (6 dogs examined).—Zone 1=dirty grey; greeny in one case. Zone 2=dirty Y; G, L or RB. Zone 3= deep B, or Bl. The appearance of the RB was associated with the deeper liver colour of the animals coats.

FLAT-COATED RETRIEVERS, BLACK (3 animals examined).—Zone 1=dirty B. Zone 2=Y ring in some cases. Zone 3= L to MB. Zone 4=DB.

GOLDEN RETRIEVERS (6 animals examined).—Zone 1=dirty B. Zone 2=dirty Y to LB. Zone 3=Rusk colour=RGB. Zone 4=MB. Zone 5=Bl. Here there are 5 distinct areas of pigmentation. The second is the most prominent.

SALUKIS (5 animals examined).—Zone 1=dirty chocolate B. Zone 2=LY or GB. Zone 3=MB Zone 4=DB to Bl ring.

ENGLISH SETTERS (5 animals examined).—Zone 1=dirty B. Zone 2=LY to GB; possibly RB streaks. Zone 3=MB. Zone 4=DB to BL. The LY is characteristic of this breed.

GORDON SETTERS (6 animals examined).—Zone 1=dirty grey or chocolate B. Zone 2=dirty Y or GB. Zone 3=MB to DB. Zone 4=Bl ring. As the body pigment gets darker so does the third area of iris pigment.

SHEEP DOGS (OLD ENGLISH) (5 animals examined).—Zone 1=dirty dark-grey brown. Zone 2=MB, they include a little Y or GB. Zone 3=DB.

SPRINGER SPANIELS (7 animals examined).—Zone 1=grey. Zone 2=Y. Zone 3=G. Zone 4=MB. Zone 5=DB to Bl ring. A red or YG are common in the third area.

COCKER SPANIELS (5 animals examined).—Zone 1=dirty B. Zone 2=dirty Y, present in a few cases only. Zone 3=MB. Zone 4=DB to Bl. The yellow appears to be absent in the lighter-coloured dogs.

AIREDALES (5 animals examined).—Zone 1=light or dark, dirty-grey. Zone 2=contains a streak of dirty Y or GB. Zone 3=darker B to Bl.

BULL TERRIERS (7 animals examined).—Zone 1=dull chocolate-brown. Zone 2=L or MB. Zone 3=DB. The "eyes" are much darker than those of most breeds, due to the dominance of the darker brown.

FOX TERRIERS (6 animals examined).—Zone 1=dull grey. Zone 2=MB. Zone 3=DB.

SKYE TERRIERS (4 animals examined).—Zone 1 = very DB. Zone 2=Y or LB. Zone 3=MB. Zone 4=DB. A golden shade may appear just before the third area.

**Discussion.**

In general terms it may be stated that the *Iris* of the dog can be divided into three definite zones for the purposes of studying macroscopically the distribution of the pigment upon the anterior surface. In many cases, however, the middle zone of pigmentation is complicated by additional rings of pigment. These may be one or two in number, but are again definite, so that it is possible to adequately describe the Iris by the use of five pigmentary areas.

The first area, lying next to the Pupil, is of dark colour, and may be described as being dirty-brown, or deep chocolate-grey. This statement is true of all the dogs studied, with the exception of a few limited cases.

The third area, extending to the Sclera, is also of dark colour in all breeds, but may be described as being dark-brown, occasionally black.

The second or middle area is not so easily disposed of, and embraces many colours, including the following :—Light yellow, dirty yellow, golden brown, light brown, medium brown, and red-brown. The dominant colour is medium brown, which extends into the third zone. Between the medium brown and the first zone lying alongside the Pupil, there are interposed rings of lighter pigment which may be recognised by the above terms. Usually the lighter yellow colours lie nearer the Pupil, followed by deeper shades. It was in no case observed that a light area of pigmentation lay in any other place than that of immediately after the first area.

The extent of the three main pigmentary areas was naturally found to be markedly affected by the condition of the Pupil. When the latter is contracted, as when just waking, zones one and two may be seen with far less difficulty than when the Pupil is dilated. Indeed, dilation of the Pupil frequently appears in the form of narrow rings instead of definite bands. The third zone is seldom affected whatever the condition of the Pupil, but for the purpose of identifica-

XUM

tion, the middle area is difficult to distinguish unless the Pupil be at least of normal width. Because of this variation, it has been considered unnecessary to state the extent of the pigmentary bands.

In addition, it was seen that these bands vary in the same breed of animal, apart from the condition of the Pupil. One animal with a dilated Pupil may possess the second zone larger than another animal with the Pupil contracted. It seems, therefore, that some secondary factor is present which determines the width of these bands of pigment ; obviously the state of the Pupil can only vary them relatively and not actually.

It was noted that the deep-brown pigmentation of the third zone of the Iris was in certain cases seen to encroach upon the Sclera (this was frequently the case in the Flat-Coated Retrievers). Further, similar pigmentation was observed to extend as far as the third eyelid, the nictitating membrane.

In man there is no such definite arrangement of the pigment, for though bands are seen next to the pupil and on the outside of the Iris, the second area is extremely diffuse, patchy and irregular.

It was, of course, impossible to avoid examining individual animals of highly nervous temperament where their pupils rapidly responded to sympathetic stimulation ; but in general terms the following breeds possessed normal Pupils : Retrievers, Setters and Spaniels. Whereas dilation was common in the Great Danes, Borzois, Greyhounds, Keeshonds, Fox Terriers, Bull Terriers, and Newfoundlands.

In every instance the appearance of the *Pupil* was that of a deep blue. In certain breeds, notably the Fox and Bull Terriers, a cursory examination of the eye would led the observer to believe that the " eye " itself (*i.e.*, the Iris) was blue. This is not the case. In the 150 dogs examined, no dog was seen to possess an Iris coloured blue. (Two dogs appeared to have a blue tinge, but of limited and very uncertain extent.) This false impression is due to the excessive dilatation of the Pupil, and from the fact that they possess no light pigment in any of the three areas which may be marked out on the Iris to contrast with the deep-coloured pupil.

If an occasion arises where it is necessary to define the colour of the Iris by one term, as green or brown, etc., it is the *dominant* pigment of the *second* zone which should be quoted.

In support of the statement made by Sisson, upon the difference which may exist between the colour of the two eyes of an animal, it was noted in several of the dark-eyed breeds that one eye possessed a shade of lighter brown in comparison with the other eye. This was

not, however, the general rule, although in but few cases may it be said that the arrangement of the pigment was exactly similar. *Any* variation which may exist is in the *second* area of pigmentation, excluding of course the " wall-eyed " dogs. It must be remembered that the animals subjected to this examination were of " Show " standard, and therefore free from possible eye blemishes which might be found in " mongrel " dogs.

The general distribution of the colours of the second area in the *whole* of the animals examined was as follows :—

Dark brown was present in 3% of the cases ; dirty yellow in 7% ; golden brown in 15% ; yellow in 16% ; light brown in 19% ; medium brown in 40%.

As regards the *breeds* examined, yellow pigment was seen in 80%, being absent in the following : Borzois, Bulldogs, Great Danes, Newfoundlanders, Bull Terriers, and Fox Terriers.

The darker breeds possess, on the whole, light or yellow-brown pigment in their second areas, and the lighter breeds possess a golden-yellow or brown. Breeds of mixed-coloured coats possess all arrangements of pigmentation of the Iris.

The red colour observed in the eyes of certain breeds was at first believed to be associated with a brindle colour of their coats, but this was not the case. Red is, however, present in breeds which have deep brown coats, *e.g.*, Golden Retrievers, Pointers, etc., but the blue-grey English Setters may also possess it.

Four dogs were noticed to possess eyes of a greenish colour tinged grey, *viz.*, a Pointer, Bulldog, Clumber, and Irish Wolfhound. In no other animals was green present.

In a very limited number of cases only can it be said that the colour of the Iris bears any relation to the colour of the animal's coat. A typical example of the variation which may occur in a breed is as follows : a Blue Dane possessed a fawn-coloured Iris ; a fawn dog of the same breed possessed a medium-brown " eye."

It has been suggested by Bradley and Grahame that the apparent variations in the colours displayed by the Iris may be dependent, not upon the presence of *several different coloured pigments*, but upon the distribution or *concentration of one pigment* in the cells of the Iris. Evidence that such is the case has been produced by Hübscher ; he examined microscopically the Iris of dogs suffering from a condition call " Birkauge." (" Birkauge " is a German term denoting eyes which possess altered pigmentation in that the normal brown colour may be supplemented or replaced by lighter colours such as bright-

XUM

yellow brown, bluish white ; or spots which are entirely white may be present.) Quotations from his summary are appropriate :—

> " The Iris of such eyes (' Birkauge ') shows no structural differences compared with brown coloured Irises."
>
> " Brown Iris spots contain very many closely packed pigment cells in the anterior (limiting) boundary membrane as in the stroma ; the lighter brown the Iris appears, the fewer colouring elements the anterior boundary layer and adjacent halves of the stroma possess."
>
> " The black hair's-breadth-wide border zone next to the Pupil is produced by the ectopic protrusion of the Retinal Iris pigment over the stroma."

## Summary.

(1) Observations were made upon the distribution of the pigment on the anterior face of the Iris of 150 pedigree dogs.

(2) Records are appended for twenty-eight breeds.

(3) In general, it is possible to divide the Iris into three pigmentary zones.

(4) The percentage colour distribution of the pigment of the second zone is noted and discussed.

(5) In general the pigmentation of the Iris of the dog bears but little definite relationship to the colour of the animals coat.

(6) Evidence is adduced which indicates that the variations of colour displayed by the Iris are due to the arrangement of the pigment cells of one type only, and not to the existence of various pigments.

My thanks are due to Mr. John Taylor, M.R.C.V.S., Honorary Veterinary Surgeon to the Scottish Kennel Club, for permission to carry out the above investigations.

REFERENCES.

(1) Bradley, O. C., and Grahame, T. Private Communication, 1928.

(2) Halliburton, W. Text-book of Physiology, 1920.

(3) Hübscher, Willy. " Uber den Bau des Birkauges vom Hunde." Inaugural-Dissertation. Brugg, 1923.

(4) Nicholas. " Veterinary Ophthalmology." 2nd Edition. 1924.

(5) Paton, Noel. " Essentials of Physiology for Veterinary Students." 3rd Edition. 1920.

(6) Sisson, Septimus. " Anatomy of the Domesticated Animals." 2nd Edition. 1917.

(7) Smith, Frederich. " Manual of Veterinary Physiology." 5th Edition. Baillière, Tindall and Cox. 1921.

## Gassed.

By FREDERICK HOBDAY. F.R.C.V.S.
*Royal Veterinary College, London.*

THE patient, a neuter cat, about two years old, was in the habit of sleeping on a shelf near the projecting tap handles (one of which was loose and easily turned) of a gas cooker, and the cat had been observed to play with this handle and partially turn it on on more than one occasion. The room in which this cooker was placed was a small one, and one morning on opening the door the owner of the premises found the room full of gas and the cat lying on the floor unconscious. The windows and doors were opened, and the gas allowed to escape. The cat was taken into the open air, and in about a quarter of an hour recovered sufficiently to walk away. The gas tap was found full on, having been, it is reasonably surmised, in view of the above-mentioned observation, turned on by the cat.

---

## Anthrax Amongst Pigs Caused by Eating Raw Flesh of a Steer.

By E. MORGAN, F.R.C.V.S., D.V.H.
*Venezuela.*

EARLY this year, while travelling in some remote parts of Venezuela, examining and injecting horses with Naganol (Bayer 205) as a preventive against Mal-de-Caderas, my attention was drawn at one place to several carcases of pigs around the yards, and one or two pigs almost expiring. During a conversation with the owner of the place, a young pig of about three months appeared making an abnormal sound during his efforts to breathe, and when urged to run dropped down and almost suffocated. Upon examining the animal one could very easily see extensive swelling of the throat and neck. Eventually it got on its feet and slowly walked away gasping for breath. The owner informed me that a few days previously a cattle-trooper had arrived there with a mob of steers, and in the late evening one of the steers collapsed while grazing in the savannah near the house and immediately died. This steer, like all the others, was apparently well a few hours before. The trooper offered him the steer for consumption, thinking that it was simply a case of exhaustion as a result of having travelled in the heat of the day without sufficient water to drink, being the dry season. This offer was wisely refused by the crofter, who noticed that the carcase soon increased in volume, and on a smaller scale resembled Sir Baden Powell's elephant which

XUM

died in the street of Kandahar, when the city fathers decided after a lengthy discussion to blow it up by means of dynamite rather than to remove the town. He also saw sanguineous spume escaping through the natural orifices, symptoms which make the camp men of Venezuela suspicious either of " peste " (anthrax) or snake bite, and of the two evils they dread the latter even more than the former.

The pigs, around two dozen in number, soon joined the vultures (Turkey-buzzards), and gave the carcase very little rest until nothing but raw bones were left. (Vultures seem quite immune to anthrax.) About the third day after the death of the steer several of the pigs were found dead, and all the others were seriously ill with dyspnœa, also extensive swellings around the throat and neck region. The mucous membranes of the eyes were deep-red in colour, diarrhœa, urine red in colour. Within twelve hours after manifesting the above symptoms, all the pigs died with the exception of the young pig previously mentioned, which gradually made a complete recovery after the lapse of several weeks.

I mention this particular case as it may be of interest to veterinary students, because it is mentioned in Ostertag's book on Meat Inspection as follows : " The meat of anthracic animals ordinarily produces no injurious consequences after being eaten, and this experimental fact is sufficiently explained by the biological peculiarities of the anthrax bacilli. As already explained, no spores develop in the meat or by ordinary methods of preservation in cool places, even upon its surface. Spore-free anthrax bacilli, however, are destroyed by the secretions of the stomach."

Mayall, in his book, " Pigs, Pigsties and Pork," states : " Swine are generally affected by eating the flesh or taking up blood or discharge-soiled matter of an animal that has died or been mistakenly slaughtered whilst suffering from the disease. The bacilli grow rapidly in the blood, causing all the appearances of a virulent septicæmia."

In Wallis Hoare's " System of Veterinary Medicine," H. Caulton Reeks states that the pig almost invariably contracts the disease by the ingestion of anthrax-infected flesh.

Boquet has shown that when guinea-pigs which have been starved for thirty-six hours ingest anthrax spores, these may gain access to the circulation without causing infection, and without producing immunity. When the skin is injured, however, as has been shown by Besredka, the guinea-pigs die of anthrax with the bacilli in their blood.

The turkey-buzzards (carrion-feeders) of the tropics of South

America consume the majority of anthrax carcases on the plains, and propagate the disease by means of their feet, feathers, etc. When they get a good meal from a carcase, they generally alight by the hundreds to drink, wash and preen themselves at the nearest pool where cattle and other animals drink. In spite of the millions of these buzzards present, and they consume the majority of anthrax carcases in the pampas, yet it is easier to find even a dead donkey than a dead buzzard.

## A Curious Incident with the Pelicans of the Victoria Gardens, Bombay.

By D. S. LAUD, G.C.V.O. F.Z.S.
*Superintendent, Municipal Gardens, Bombay.*

I BEG to record in those short notes a curious incident which happened with the pelicans in the Victoria Gardens a few days ago.

On the afternoon of September 4th, 1930, two Pelicans were found with Water Tortoises hanging from their beaks in the Aquatic Birds' Pond in the Gardens ; and they were trying to swallow them. Each of the tortoises weighed 9½ lb., with the length of the shield about 9½ inches, and breadth about 8½ inches.

As soon as the keeper noticed this incident he drove these Pelicans out of the pond, and when they were on the lawn they immediately threw the tortoises out of their mouths. One of the Pelicans in the act got injuries to the pouch on the off side, caused by the nails of the foot of the tortoise, with the result that there was a lacerated wound about four to five inches in length, exposing the anterior opening of the gullet. The wound was dressed and treated with antiseptics, and about eight stitches were put in. The Pelican showed no difficulty at the time of swallowing food. The wound healed up within a month, and the Pelican is now in the pond with others, as happy as ever. The food of the Pelicans consists of meat and fish.

## The Use of Swine Fever Serum.

By J. M. BUCHANAN, M.R.C.V.S.
*Stowmarket.*

SWINE fever among our pig population is more or less always with us. In view of this fact any means of successfully combating the ravages of the disease will always receive a fair and sympathetic trial by those of us called on to deal with it. To-day swine fever is usually treated, and in contact pigs protected, with large doses of a

XUM

hyper-immunised serum prepared from artificially infected pigs. This method in the hands of the writer has met with varied results, and his experiences may prove interesting.

Suffolk was visited with a virulent epidemic of swine fever in 1929, which raged for six months, and when all were congratulating themselves in getting the upper hand, the dying embers blazed up into another conflagration in the following autumn. Swine Fever Serum was used by the writer in many cases, and the results from typical examples are set out in the accompanying table :—

| Out-break | Type of Disease | Type of Pig | Number Treated | Mor-tality | Serum Used | Results |
|---|---|---|---|---|---|---|
| 1 | Highly Virulent | Affected | 38 | 35 | Inter. Serum Co. | Failure |
| 1A | — | In contact | 135 | 28 | do. | Success |
| 2 | Virulent | Affected | 59 | 50 | Bayer's | Failure |
| 2A | — | In contact | 83 | 21 | do. | Partial success |
| 3 | Mild | Affected | 33 | 31 | Cutter | Failure |
| 3A | — | In contact | 126 | 6 | do. | Success |
| 4 | Virulent | Affected | 29 | 7 | Cutter | do. |
| 5 | Virulent | In contact | 105 | 5 | Int. Ser. Co. | do. |
| 6 | Highly Virulent | Affected | 8 | 8 | do. | Failure |
| 7 | Mild | In contact | 60 | 12 | do. | Partial success |
| 8 | Virulent | Affected | 50 | 43 | Bayer's | Failure |
| 9 | do. | In contact | 30 | *Nil* | Inter. Serum Co. | Success |
| 10 | do. | Affected | 18 | 8 | do | Partial success |
| A | — | In contact | 180 | 41 | do. | do. |
| 11 | Mild | Affected | 16 | 13 | do. | Failure |
| A | — | In contact | 30 | 26 | do. | do. |
| 12 | — | Suspected in contact | 33 | 2 | Bayer's with vaccine | (?) |

From the table it will be seen that out of 251 affected and given large doses of serum, and in many cases repeated at intervals, the mortality was 195, *i.e.* 77%. This does not include Case 12, which really comes in a class by itself, but is mentioned here because of its interest. Among the in-contact pigs treated, the mortality in the 654 treated was 139 or 18%.

The type of epidemic among the in-contact pigs appears to have little bearing on the mortality. In Case 11a, a mild type, it rose to 86%, but of this more anon.

Case 12 was done more or less as an experiment. The premises were in the heart of a circle of infection. The pigs appeared healthy, but the owner was naturally anxious. The sows and boars were injected with serum and suipestifer vaccine. Two months later a sow was found dead. On post-mortem, acute inflammation was

found around the ileo-cæcal valve, and typical button ulcers in the last part of the colon.

In Case 3, two young gilts were injected and put in among the infected, and one gilt from the same litter was not injected, and put in as a control. One of the injected died, the control and the other survived, and have to-day litters of healthy pigs.

The evidence in favour of the use of swine fever is conflicting. On one hand, pigs have rapidly recovered with its use, and on the other, have died in spite of it.

In-contact pigs are also something of an anomaly. Sometimes one shouts "Eureka" when everything in the garden seems lovely after its use, and on the other, as in Case 11a, when something goes wrong, and one can only "cuss." The writer propounds the theory (with much diffidence) that before injecting in contacts, temperatures should be taken, and all 2 degrees above normal should be isolated.

Serum alone for the treatment, or even protection, against swine fever leaves much to be desired. The cost for its indiscriminate use is prohibitive where large numbers are dealt with. It has no effect on the disease once it is established, even when a virus alone infection appears to be present. It is useless when the hands of *B. coli*, suipestifer, etc., have commenced their ravages.

# Reviews

**Dollar's Veterinary Surgery.** 2nd edition. Re-written and extended by Professor J. J. O'Connor. Pp. ix+953, with 495 illustrations. London: Baillière, Tindall & Cox. Price 25*s*.

ORIGINALLY published as far back as 1895 under the title of Moller's "Veterinary Surgery," translated and revised by the energy of that well-known and enthusiastic worker, Mr. J. A. W. Dollar. This work appeared again in 1912 as Dollar's "Regionnal Veterinary Surgery and Operative Technique," incorporating Moller's "Veterinary Surgery," and was re-issued in 1920. The present edition, although called Dollar's "Veterinary Surgery: General, Operative and Regional," is in reality an almost entirely new work, for although it is based on Dollar's book, and many of his illustrations have been used, the greater part of the text has been re-written and greatly extended. The veterinary student is fortunate in thus having the advantage of the authority of men whose experience covers a period of nearly fifty years. As illustrating how veterinary surgery has progressed during that time, we have the fact that in Dollar's first translation the volume only contained 733 pages with 142 illustrations, whilst this present edition (which Professor

O'Connor admits to having been compelled to "cut down" in order to economise space and printing) has 953 pages and 495 figures in the text. In his Preface, Professor O'Connor draws attention to this, saying that it has only been made possible by omitting such anatomical descriptions as can be obtained from works on anatomy, by abbreviating where possible, and by omitting references of dubious value which admit of discussion.

Certain entirely new features, including a whole section on General Surgery (described as Part I), and a re-arrangement with the re-writing of several chapters in Parts II and III, have been added, the whole being brought into line with modern antiseptic and surgical methods; authors' names being generously acknowledged where credit is due.

Part I deals with inflammation, abscess formation, gangrene, sinuses and fistulæ, wounds of all kinds and their complications, tumours and cysts, affections of muscles, joints, bones, tendons and synovial sheaths, nerves and blood vessels, and these are discussed from a general point of view.

In Part II, which is headed "Operative Surgery," certain methods of securing and fixing for operative purposes are selected, and the student is given the details for the preparation of the patient both for this and for the administration of anæsthetics to each variety of animal.

In Part III, Regional Surgery is entered into, the whole of the body from the lips and nose to the tip of the tail being discoursed upon in regard to the operations necessary to be performed.

The subject, when it is attempted to effectually include the whole of the surgery of *all* the animals in one single text-book is almost an insuperable one, for Veterinary Surgery is becoming almost as much specialised as is the surgery of man, not perhaps so much for individual operative measures, but specially differentiated for the various species of patients which come within a veterinary surgeon's sphere; and in this respect our Continental neighbours have an advantage over us in that almost all have Government aid when it comes to a matter of the cost of publication. In England it is usually a matter for private arrangement, and few men are able to expend the capital required to retain the rights of publication, hence our comparative poverty of original text-books in Veterinary Science.

Professor O'Connor's revision will be much appreciated by both student and practitioner, and the price at which the publishers have sent it out (25*s*.) brings it within the range of all.

---

**A Handbook for Veterinary Surgeons.** By FRED BULLOCK, LL.D., Barrister-at-Law, with Preface by SIR JOHN M'FADYEAN, LL.D., B.Sc., M.B., M.R.C.V.S. 2nd Edition. Pp. 190. Price 5*s*. net. London: Messrs. Baillière, Tindall & Cox.

WE welcome again this little handbook by DR. Bullock, and the fact that it has reached a second edition so quickly is evidence of the way in which it has been appreciated by members of the profession.

When Dr. Bullock's first edition appeared it filled a long-felt want in Veterinary literature, traversing as it did (and this second edition

has added considerably to the matter printed in the first) the acts which guide the road on which the profession has to travel, particularly in respect to the pitfalls into which the younger graduates are likely to tumble within the first few years of gaining the Diploma.

The First Chapter of the present edition deals entirely with the administration of the profession, and especially draws attention to the powers of the College, including the procedures which have to be gone through, both for registration and restoration, in the event of the removal of one's name.

In the Second Chapter, the professional responsibilities of the members, together with their privileges, are fully recited; and the Third Chapter will be of particular interest again to the young graduates, especially those who are in private practice, as it relates to partnerships, the purchase of practice, and the general laws of etiquette which guard the relations of one member with another.

In the Fourth Chapter there is a complete *résumé* of the law concerning negligence, and a summary of the legal responsibilities and duties which come in the category of the duties of a veterinary inspector.

Chapter V deals with post-graduate studies, and Chapter VII with the Army and Government services; whilst the remaining pages are filled with appendices containing the Acts and Orders of the Ministry of Agriculture, and other official bodies.

The book is completed by a useful afterthought in that some five pages are devoted to the addresses of the various Veterinary Societies.

A book of this kind needs no words from the reviewer to say other than that this little work is so useful that it should be kept in a handy place where it can be picked up at any moment for reference.

---

# Personal

At a Meeting of the Diseases of Animals Sub-Committee of the Devon County Council, Mr. P. Fisher and Mr. H. S. McShane were appointed Veterinary Inspectors under the Contagious Diseases of Animals Act for the districts of Okehampton and Honiton respectively.

---

Messrs. Marsh and Baxter, the proprietors of the well-known bacon-curing establishment at Brierley Hill, recently recommended that the salaries of each of their Veterinary Inspectors (who are responsible to the Brierley Hill Council for the efficiency of their duties) should be increased by the sum of £75 per annum, and the proposal was carried unanimously.

---

At a recent meeting of the Committee of the Animal Diseases Research Association held in Edinburgh, the Association resolved to establish a Department of Physiological Biochemistry, and Professor Henry Dryyer

was appointed to the position of Chief Biochemist, with Miss J. W. M'Callum Ph.D., B.Sc., as assistant.

These appointments were made as an acknowledgment to the aid which Professors Russell Greig and Dryyer had demonstrated as coming from biochemistry to the cure of disease; the recent work done on Milk Fever in cattle being an especial illustration.

---

THE following list gives the names of candidates selected for Colonial Veterinary Scholarships. Holders of these scholarships will, subject to vacancies being available, normally be offered appointments in the Colonial Service on completing satisfactorily their course of training :—

| Name | University or College |
|---|---|
| Anderson, J. ... ... ... ... | Edinburgh |
| Gordon, R. F. ... ... ... | Aberdeen |
| James, A. J. ... ... ... ... | Royal Veterinary College, N.W. |
| Lancaster, W. E. ... ... ... | Cambridge |
| Mair, A. ... ... ... ... | Aberdeen |
| Prentice, E. G. ... ... ... | Glasgow |
| Purchase, H. S. ... ... ... | London |
| Robertson, A. ... ... ... | Aberdeen |
| Wells, C. W. ... ... ... ... | London |

## Cruft's Show.

We understand that Messrs. Entwistles, Ltd., the well-known Dog Food Manufacturers of Liverpool, will be exhibiting their Specialities at Cruft's Show, to be held on Wednesday and Thursday, February 11th and 12th. The firm extend a cordial invitation to all Veterinary Surgeons attending the Show to visit them at their Stand 52–54.

---

# Publishers' Notices

All communications should be addressed to 7 & 8, Henrietta Street, Covent Garden, London, W.C. 2. Telephone: Temple Bar 4646. Telegrams: "Baillière Phone, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

Copy of advertisements should be in the hands of the publishers — Baillière, Tindall and Cox—not later than the 25th of the month, or if proof is required, not later than the 23rd.

**Binding Cases** for Volume 86 and any other previous volumes can be obtained from the publishers. Price 2*s.* 9*d.* post free.

Annual Subscription, 21*s.* ($5.00 U.S.A. currency) post free.